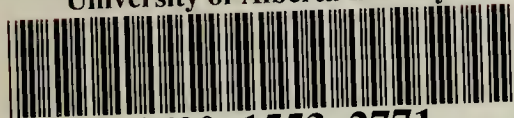


University of Alberta Library



0 1620 1553 2771



EX LIBRIS
UNIVERSITATIS
ALBERTENSIS



Digitized by the Internet Archive
in 2019 with funding from
University of Alberta Libraries

<https://archive.org/details/bluejay571sask>

BLUE JAY

March 1999



Blue Jay, founded in 1942 by Isabel M. Priestly, is a journal of natural history and conservation for Saskatchewan and adjacent regions. It is published quarterly by **Nature Saskatchewan, 206-1860 Lorne Street, Regina, Saskatchewan, S4P 2L7.**

CN ISSN 0006-5099.

Editor: Roy D. John

Associate Editors: Ronald Hooper, Carol A. Scott, C. Stuart Houston, G.R.A. Ebel, James Duncan, Ross Dickson, Mark Brigham, Robert Warnock.

EDITORIAL INFORMATION: All items for publication should be addressed to the editor, care of Nature Saskatchewan (see address at top). Deadlines for each issue are two months prior to issue, i.e. 1 January, 1 April, 1 July, and 1 October. Please include author's telephone number for editorial contact, if necessary. Manuscripts should be submitted in duplicate. Manuscripts may also be submitted in text file form on 3.5 inch diskettes, which will be returned to authors when copies have been made. Word Perfect files may be sent to the NS office as an attachment to an E-mail message. The NS internet address is nature.sask@unibase.com. NS also has a home page on the internet. The address is <http://www.unibase.com/~naturesk>. The editor uses Word Perfect 6 and can accept manuscripts in any format. For further assistance see "Guidelines for Authors," *Blue Jay* 54: 174-175 and 56: No. 3 ii, or contact the editor. R.W. Nero abstracts *Blue Jay* for *Recent Ornithological Literature*. *Blue Jay* is abstracted by BIOSIS.

Common names are used for species where possible. Bird names follow the 1983 revision of the *American Ornithologists' Union Check-list* and subsequent supplements. Mammals are from Banfield's *The Mammals of Canada* (1974). Fish names are from the American Fisheries Society Special Publication #20 (1991). Since insect, herpetile and plant names are not standardized, scientific names are included, with authorities where deemed necessary.

Photographs submitted may be slides or prints. Nature Saskatchewan does not guarantee that any photographic submissions will be returned. Send a copy, unless you do not want to save the original. Prints will be returned on request. Deadlines for photographic materials are one month prior to issue, i.e. 1 February, 1 May, 1 August, and 1 November.

Any material printed for the *Blue Jay* may be reproduced without permission. Credit lines are appreciated. Use of photographs and poetry requires permission from the photographer/author.

ADVERTISING: Advertising rates may be obtained from Nature Saskatchewan (address at top).

REPRINTS: A maximum of five reprints of an article are available to authors for a charge of \$0.25 each. Contributors wishing a few extra copies of the current issue may get them at cost. Requests for reprints or extra copies should be made to the Nature Saskatchewan office when the materials is submitted for publication.

SUBSCRIPTION: Send all renewals, new memberships and correspondence concerning changes of address to Nature Saskatchewan (address at top). Renewal form on last page.

Bulk orders (minimum of five copies to one address) are available to society members and educational institutions at the rate of \$15 for the first subscription and \$13 for each additional one. Outside Canada, fees are \$18. We do not collect GST on memberships.

Cover: White Water-Lily Garden, Teresa Dolman

Published by the Administration Centre Printing Services. Printed in Regina, Saskatchewan on 10% recycled paper.

THIS ORGANIZATION RECEIVES FUNDING FROM



Blue Jay

Editor's Message

ii

Birds

57th ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT - 1998.

Wayne C. Harris 1

TURKEY VULTURE NESTS IN ABANDONED BUILDINGS IN SW MANITOBA

Dean J. Berezanski 28

Mammals

SASKATCHEWAN CHRISTMAS MAMMAL COUNT - 1998. Wayne C. Harris 34

Plants

STUDIES ON A BLOOM-FORMING BLUE-GREEN ALGA, ANABAENA FLOS-AQUAE IN

THE WASCANA LAKE IN REGINA. H.E. Mann and M.V.S. Raju 45

Amphibians and Reptiles

CLUTCH SIZES IN MANITOBA COMMON SNAPPING TURTLES.

Dean J. Berezanski 50

Notes and Letters

VARIED THRUSH AT WALDHEIM. Barb Epp 56

THE REGAL FRITILLARY IN SASKATCHEWAN. Ron Hooper 57

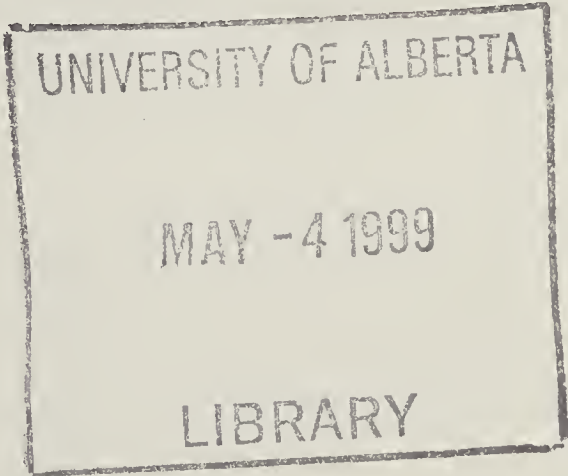
SIGHTING OF A BAND-TAILED PIGEON AT MEDICINE HAT. Sig Jordheim 58

Nature Library

OUT AND ABOUT - FIFTY YEARS OF WILDLIFE WATCHING. Doug Gilroy 59

A FIELD GUIDE TO EASTERN BUTTERFLIES. Paul A. Opler and Vichai Malikul 61

THE BUTTERFLIES OF CANADA. Ross Layberry, Peter Hall and Don Lafontaine 63



EDITOR'S MESSAGE

This edition will mark further changes for the Blue Jay. I have now accepted the post of Program Manager, Environmental Management Systems Registration at the Canadian General Standards Board in the National Capital Region. This means I can no longer continue as editor. I do not live in the prairies. Anna and Ted Leighton have agreed to take over as joint editors for the June issue. However this cannot happen until Anna's commitment as Editor of Birds of Saskatoon is complete. I will stay as editor then, until the December issue. Stuart Houston and Joe Schmutz have volunteered to assist me, especially with the September issue. The March issue was prepared between myself, Stephanie, with input from Stuart Houston. Wayne Harris contributed his excellent summaries of the Christmas Bird and Mammal Counts.

It is heartwarming to have talented people come forward and assume these responsibilities. It has transformed what could have been a crisis into a smooth - we hope! - transition. This is a clear sign of the health of our organization.

There will be many things I will miss when I finally resign as editor (and only one I will not miss is stripping format codes!). I have particularly enjoyed working with the authors. We have had many fine and fascinating articles in these last few years. I have had the extra pleasure of discussing these manuscripts directly with their creators. I have also shuffled some material between myself and my colleague, Dr. Francis Cook, editor of the Canadian Field Naturalist (CFN) (incidentally I have already volunteered to re-join the Publications Board of the Ottawa Field Naturalists. publishers of CFN).

Anna and Ted will, I know, be excellent editors and I hope they get as much out of their work as I did. I wish them all the best.

Blue Jay has used the term "herp(e)tile" for some time. There have been two occasions in the last two years when the spelling has been challenged. I finally decide to discuss this with Dr. Francis Cook, ex-Curator of Reptiles and Amphibians at the National Museum and Editor of the Canadian Field Naturalist. Francis tells me that "herp(e)tile" is not a real word. It is an unacceptable combination of Greek and Latin (hepetazoa would be better). Blue Jay does not typically use slang terms, so hence forth herpetile will be replaced by "reptiles and amphibians."

Sincerely,

Roy D. John

UNIVERSITY LIBRARY
UNIVERSITY OF ALBERTA

57th ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT - 1998

Compiled by Wayne C. Harris, Saskatchewan Environment and Resource Management, 350 Cheadle Street West, Swift Current, SK S9H 4G3

Counts were completed for 97 localities during the 1998 count period (December 18 - January 3). This is six less than last year but close to the long term average. Several long term counts were not done due to the windy conditions.

The weather leading into the Christmas count period was mild and generally snow free, at least in the south. Province wide snow cover did not occur until the end of December.

The mild temperatures ended on the first day of count period and then normal winter temperature prevailed. The average minimum temperature was -24°C and the average high was -18°, slightly below long term averages. Beauval recorded the coldest temperature (-38°C) and Moose Jaw the warmest (-7°C). Wind was probably the biggest factor for the counts.. Minimum daily wind speeds averaged almost 7 kmph while the maximum average was more than 14 kmph, both well above average. Several counts had sustained daily winds of 50kmph. Table 1 summarizes weather conditions during the counts.

The total number of participants in the 1998 count was 735, less than last years record number but still well above average. Observers walked more than 738 km in 376 hours, drove 12,842 km in 555 hours and spent 413 hours watching their feeders. Details of count

effort and habitats covered are found in Table 2.

The birds

One hundred and eight species were recorded during the count period, 103 of these on count day with five more seen during the count period. In addition to these there were two recognizable subspecies (Table 3, 4 and 5). Although this is less than last years record 121 species it is till well above the average and exceeds the second highest total of 100 species recorded during both 1988 and 1996 counts.

Saskatoon topped the number of species recorded with 45 while Fort Walsh's was second with 40. These were the only counts to reach 40 species and there were only six others that reached 30 species.

With the high number of species it is not surprising that the total number of individuals seen is also high. A total of 123,567 individuals were tallied second only to last years record.

The front runners in most abundant bird category were Snow Bunting and House Sparrow. The most frequently recorded species was Black-billed Magpie (98% of the counts) and Black-capped Chickadee (89%). Surprisingly, Common Ravens were found on 71% of the counts far exceeding any other count year.

New Species

One new species was recorded this year bringing the all time list to 168. Two male Eastern Bluebirds seen during the count period feeding on chokecherries (accompanied by a female Mountain Bluebird) were Saskatchewan's first count record. These birds, found by Dave Phillips in the Craven count circle, were later observed by several other birders.

Other rarities

Table 4 lists the least frequent species on the counts and the rarest species are all in this table. A Pied-billed Grebe found at Fort Qu'appelle is the first record in a number of years. For the second year in a row Willow Ptarmigan have moved well south of their normal winter range with Love - Torch River having two. Two Killdeers at open springs in Saskatchewan Landing Provincial Park were only the third record with both other occurrences coming from Govenlock in 1982 and 1990. A Belted Kingfisher at Crooked Lake was also a third Christmas count record. The Mountain Chickadee at Cypress Hills Provincial Park was there for the third consecutive year. A female

Northern Cardinal at Fort Qu'appelle was only the fourth record and a Vesper Sparrow at Govenlock was a third record. A total of three Varied Thrushes were present this Christmas with singles at Waldheim count day and count period observations from Archerwill and Saskatoon.

Population trends

A number of new high counts were recorded (Table 6). The 24 Ruffed Grouse at Snowden was a new high. Saskatoon recorded new highs for both Black-billed Magpie and Black-capped Chickadee. The nine American Goldfinches at Kenosee Lake was exceptional not only for the high number but also for the general rarity of the species.

Although there were more Northern Goshawks this year compared to last year the long term trend is down and a similar pattern holds true for Prairie Falcon (Table 7). Snowy Owls populations were at there lowest number in the past decade but their long-term trend is stable. Winter finches were generally very low; most notable were Evening Grosbeaks, Pine Grosbeaks and both species of crossbills.



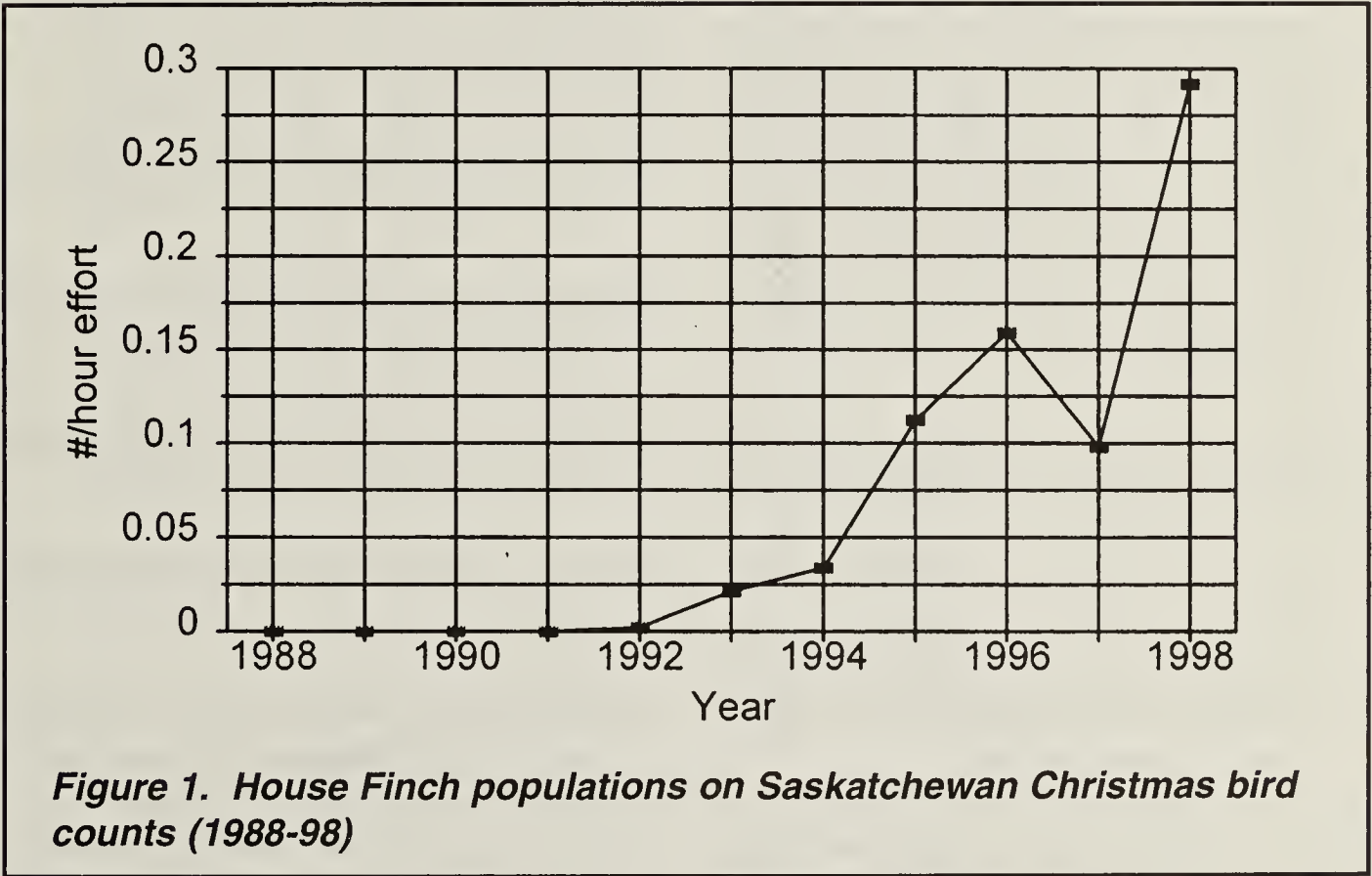
Snowy Owl

Bob Mitchell

Both Gray Partridge and Ring-necked Pheasant have shown some recovery since the difficult winter of 1996-97 though numbers are still below the long term average. Ruffed Grouse numbers dropped slightly this year but are still above long term averages. Resident corvid populations are high most notably Black-billed Magpies and Common Ravens. Ravens were remarkably common south of the forest and their increasing winter distribution has been ongoing over the past two decades.

This year 71% of the counts recorded ravens with only those counts of the extreme southwest having no ravens.

House Finch numbers in Saskatchewan follow the continental pattern and continue to increase. First reported on a count in 1992, numbers and locations have increased dramatically in the past six years (Figure 1). Not only are they found on large urban centre counts but are now also on smaller town counts.



Count Areas and Participants

(Names of compilers are in italics).

1. ARCHERWILL. Faye Black, *Ken Folstad*, Pauline Hnetka, Annette Kozak, Judy Revoy, Doris Slind.
2. ARMIT. Valeri Harris, *Wayne Harris*, Sheila Lamont.
3. BANGOR. *Jean Hilton*.
4. BEAUVAL. *Jim Mills*, Rick Sanderson.
5. BIGGAR. Dale Booth, Wayne Renaud, *Guy Wapple*, Robert Wapple, Sandra Wapple.
6. BIRCH HILLS. Marg Mareschal, *Moe Mareschal*, Don Weidl.
7. BRIGHTWATER RESERVOIR. Keith Hobson, *Alan Smith*.
8. BROADVIEW. Marlene Barnes, Ted Barnes, Doug Boivin, Barbara Weidl, *Don Weidl*, Lorraine Weidl, Tony Weidl.

9. BROMHEAD. Martin Bailey, *Carol Bjorklund*.
10. CANDLE LAKE. Carmen Dodge, Marg Mareschal, Moe Mareschal, *Don Weidl*.
11. CHITEK LAKE. *Marcel Cornect*.
12. CLARK'S CROSSING. Carol Blenkin, Lucille Bradatsch, Erin Chatwell, Dave Cook, Louise Cook, Martha Guy, Tim Haughian, Darlene Hay, Jim Hay, Marlene Kalanack, Kay Krueger, Sarah Kuzmicz, Gerard Lahey, Doug McLean, Mack Miller, Garth Nelson, Menno Nickel, Hilda Noton, Lynn Oliphant, Randy Olson, Betty Penner, Stan Shadick, Rhonda Shewfelt, Martin Stoffel, Loren Teed, Ivor Thokle, Kirk Wallace, *Michael Williams*, Jim Wood.
13. COCHIN. *Daryl Johannesen*, Kaitlin Johannesen, Kristine Johannesen.
14. COLD LAKE, AB - PIERCELAND, SK. Jessica Roy, J. Frank Roy.
15. CORONACH. Valeri Harris, *Wayne Harris*, Sue McAdam.
16. CRAVEN. Margaret Belcher, Betty Binnie, Jim Cummings, Norman Herriot, *Trevor Herriot*, Phil Holloway, Bob Kreba, Kevin Moore, Ron Myers, Curtis Pollack, Dylan Pollack.
17. CROOKED LAKE. Bill Livsay, Mayta Livsay, Boyd Metzler, John Pollock, *Dorothy Skene*, Ed Skene.
18. CROOKED RIVER. *Margaret Mehler*, Morley Mehler.
19. CYPRESS HILLS PROVINCIAL PARK (Centre Block). Gary Churchill, Enid Cumming, John Douglas, Shirley Helmerson, Marilyn Scheller, Val Harris, Wayne Harris, Cameron Lockerbie, Sue McAdam, *Melody Nagel-Hisey*, Steve Van Wilgenberg.
20. DUCK LAKE. Keith Hobson, *Alan Smith*.
21. DUVAL. George Herber, *Lloyd Saul*.
22. EASTEND. *Robert Gebhardt*, Joan Hodgins.
23. EMMA LAKE. Glen Hanson, Jean Hanson, *Deanna Krug*, Norman Krug.
24. ENDEAVOUR. *Norman Harris*.
25. ESTEVAN. Valeri Harris, *Wayne Harris*, Sue McAdam.
26. ESTUARY NORTH. Cathy Cocks, *Dean Francis*.
27. FENTON. *Carman Dodge*, Don Weidl.
28. FIFE LAKE. *Martin Myers*, Robert Rafuse.
29. FORT QU'APPELLE. James Armstrong, Phyllis Bordass, Errol Cochrane, Anne Davies, Doug Harman, *Ronald Hooper*, Calvin Horseman, Alice Isfan, Vic Lamontagne, Kaye Lindgren, Jack Lowe, Allan Mlazgar, Webb Palmer, Paul Paquin, Lorne Rowell, Lloyd Talbot.
30. FORT WALSH. Pat Bulman, Valeri Harris, Wayne Harris, Ron Jensen, Burke Korol, Sheila Lamont, Susan McAdam, Wilkes Parsonage, Wayne Renaud, *Guy Wapple*.
31. GARDINER DAM. Pat Bulman, Terri Davidson, Greg Fenty, Valeri Harris, Wayne Harris, Mary Houston, Stuart Houston, Jeff Jensen, Ron Jensen, Burke Korol, Sheila Lamont,

- Cameron Lockerbie, Susan McAdam, Wayne Renaud, *Guy Wapple*.
- 32.GOOD SPIRIT LAKE. *Bill Anaka*, Joyce Anaka, Dorothy Riesz, Ray Riesz, Julia Wiwchar.
- 33.GOVENLOCK. Pat Bulman, Valeri Harris, *Wayne Harris*, Ron Jensen, Burke Korol, Sheila Lamont, Sue McAdam, Wayne Renaud, Guy Wapple, Robert Wapple.
- 34.GRASSLANDS NATIONAL PARK (NW). Alison Amero, Denis Blais, Shelly Duquette, Pat Fargey, Travis Godneir, *Olaf Jensen*, Dennis Madsen, Carol Masecar, Julie Parsonage.
- 35.GRAYSON. *Charles Helm*, Daniel Helm, Linda Helm, Karl Zimmer.
- 36.HARRIS. Wayne Renaud, *Guy Wapple*, Robert Wapple.
- 37.HEPBURN. Alice Pilatus, *Phyllis Siemens*.
- 38.HERSCHEL (Coal Mine Coulee). Wayne Renaud, *Robert Wapple*.
- 39.HOLBIEN. Chlorus Harris, *Helen Harris*.
- 40.HORSESHOE BEND (North of Kinistino). Daveen Berg, Dannelle Messer, *Verna Messer*, Alexis Simmons.
- 41.INDIAN HEAD. Carol Beaulieu, Denise Beaulieu, Graeme Beaulieu, Lauren Beaulieu, Mark Beaulieu, Vic Beaulieu, Irv Escott, *David Gehl*, Roberta Gehl, Gordon Howe, Dora Nichols, Ellen Varley, Ann Willerth, Gordon Willerth.
- 42.KAMSACK. George and Hazel Bernard, Agnes Betz, Mable Buceuk, Marlon Brock, Fred Chornoff, Lindee Dewores, Barb and Doug Elsaser, Bill Koroluik, Laura Loeppky, Leslie and Molly Pool, Kelsey and Ryley Rezansoff, *Isabel Ritchie*, Elsie Severson, Selma Smandych, Elenor Sookocheef, Joyce Ualow, I. Zeiben.
- 43.KELVINGTON. Pat Finnie, *Dianne Sloan*, Marguerite Sloan.
- 44.KENASTON. *Lawrence Beckie*.
- 45.KENOSEE LAKE. Boyd Metzler, *John Pollock*.
- 46.KINDERSLEY. *Jean Harris*, Keith Harris.
- 46.KINISTINO. *Chris Derksen*.
- 47.KINLOCH. *Don Forbes*, Doreen Forbes, Merle Jackson, Cliff Logan, Florence Olecsiewicz, Wilf Rodenberg.
- 48.KUTAWAGAN LAKE. Valeri Harris, *Wayne Harris*, Sheila Lamont.
- 49.LAST MOUNTAIN LAKE N.W.A. Anne Harris, Valeri Harris, *Wayne Harris*, Sheila Lamont.
- 50.LEADER (North). *Daisy Meyers*.
- 51.LEADER (South). *Brenda Flood*, John Flood.
52. LIVELONG. *Sarah Pavka*.
- 53.LOVE - TORCH RIVER. Ken Blaine, Lorna Blaine, *Bert Dalziel*, Duke Dalziel, Joan Dalziel, Kari Dalziel, Nora Dalziel, Sara Dalziel, Betty Donovan, Bruce Donovan, Eileen L'Heureux, Paul L'Heureux, George Lidster, Jean Lidster, Mildred Long, Lynn Matthews, William Matthews.

54. LUSELAND. Kelly Cotter, Estelle Finley, Graeme Finley, Kerry Finley, *Kim Finley*, Laura Finley, Theron Finley, Val Finley, Bill Frey, Brent Honeker.
55. MACDOWALL. *Myron Barton*.
56. MAYVIEW. *Judith Graham*.
57. MEADOW LAKE. Bill Caldwell, Byron Golly, Stuart Golly, Tyler Golly, Lorraine Twidale, Joe Twidale, *Bob Wilson*.
58. MELFORT. *Frieda Markland*.
59. MELVILLE. Donna Alberts, Bill Barmby, *Marion MacLean*, Mildred Wotherspoon.
60. MISSINIEPE. *Shirley Glass*.
61. MOOSE JAW. Elsie Adkins, Jack Adkins, Pam Albert, Ron and Vi Anderson, Vivien Brailean, Doug and Helen Brunsdon, Barry and Fern Dowse, Al Gurnsey, Kerry and Robert Handley, Bob and Pat Kern, Eve King, Cy and *Leith Knight*, Allan Lemieux, Bill McDonald, Connie and Hugh McIntyre, Jean Anne and Len Mowchenko, Helen and Peter Norys, Lloyd Stewart, Arie Van Dorland.
62. MOOSE MOUNTAIN. *Greg Bobbitt*, Ross Douglas, Dick Gutfriend.
63. NAICAM. *Lavawn Jensen*.
64. NIPAWIN. Vi Budd, *Joyce Christiansen*, Bert Dalziel, Judith Friswell, Doug Pegg, Helen Pegg, Shirley Phillips, Jocelyn Thresher, Ruth Thresher.
65. NISBET FOREST WEST (NW of Crutwell). Kim Clark, Kiri Clark, Suzanne Clark, Ev Marshall.
66. PIKE LAKE. Nancy Allan, Tony Allen, Lawrence Beckie, Carol Blenkin, Patrick Bulman, Debbie Chatfield, David Cook, Louise Cook, Chantel Crossman, Mary Gilliland, Bob Girvan, Bernie Gollop, Mike Gollop, Robert Johanson, Regina Koenders, Kay Krueger, Gerard Lahey, Hilda Noton, Keith Pahl, Amanda Plante, *Frank Roy*, Maureen Scarfe, Doug Schneider, Marguerite Schneider, Stan Shadick, Martin Stoffel, Kirk Wallace, Ron Watson, Karen Wiebe, Michael Williams, Kay Willson, Phil Willson, Jim Wood, Lois Wooding, Adelle Young, Jackson Young, Nancy Young, John Yuen.
67. PORCUPINE PLAIN. *Keith Larwood*.
68. PREECEVILLE. Francis Buryk, Peter Buryk, Dallas Fairburn, Mary Mitchell, Muriel Mitchell, *Russ Peet*, Leona Pollock, Ella Smith, David Weiman.
69. PRINCE ALBERT. Les Anderson, Barry Bell, John Burt, Pamela Burt, Kim Clark, *Carman Dodge*, Keith Dodge, Philippe Gaudet, Joe Graumans, Alice Hambleton, Don Hambleton, Sandra Jewel, Eric Laing, Joyce Laing, Lillian Lubky, Jennie Mindiuk, Gerald Murphy, Helen Placsko, Les Senner, Winona Senner, Ted Snow, Beryl Wait, Don Wait.
70. PRINCE ALBERT NATIONAL PARK. Susan Carr, Allison Fisher, Bill Fisher, Kim Fisher, Ruby Fisher, Dan Frandsen, Jay Frandsen, Shanna Frith, Doug Gullickson, Scott Keesey, Brad Lloyd, Kurt Mazur, Bradley Muir, *Adam Pidwerbeski*, Lawrence Pidwerbeski, Samuel Pidwerbeski, Jeni Rudisill, Bob Turnbull, Dave Wieder, Cam Zimmer, Robin Zimmer.

71. QU'APPELLE VALLEY DAM. Cameron Lockerbie, Frank Roy, *Michael Williams*, Phil Willson.

72. RAYMORE. Anne Harris, Valeri Harris, *Wayne Harris*, Sheila Lamont.

73. REGINA. Peter Ashcroft, Delmar Bamford, Margaret Belcher, Lionel Bonneville, Stephane Bonneville, Rick Douslin, Jim Elliott, Janet Galger, Jonathon Herriot, Kate Herriot, Trevor Herriot, *Dale Hjertaas*, Estelle Hjertaas, Paule Hjertaas, Phyllis Ilsley, Bob Kreba, Linda Langenbacher, Rheal Laroche, Catherine Ann Marr, Anne-Marie Murphy, Ron Meyers, Jean Ottosen, Katrina Ottosen, Jean Parker, Wayne Pepper, Brian Rainey, Curt Schroeder, Gerald Small, Kim Stevenson, Frank Switzer.

74. ROCKGLEN - BORDERLAND. *Bob Rafuse*.

75. ROUND LAKE (Qu'Appelle Valley). Pat Connolley, *Doug Francis*, Boyd Metzler, John Pollock, Pat Ward.

76. SASKATCHEWAN LANDING PROVINCIAL PARK. Val Harris, *Wayne Harris*, Jeff Jensen, Ron Jensen, Cameron Lockerbie, Susan McAdam.

77. SASKATCHEWAN RIVER FORKS. Carman Dodge, *Don Weidl*.

78. SASKATOON. Bruce Acton, Don Adams, Darlene Aikman, Nancy Allan, Tony Allen, Juhachi Asai, Kengo Asai, Rika Asai, Sumiko Asai, Bob Besant, Jeff Besant, Joyce Besant, Bruce Brotzel, Don Beazely, Mark Bidwell, Gladys Baxter, Howard Baxter, David Cook, Louise Cook, Eileen Dalglish, Ed Driver, Marg Driver, Randi Edmonds, Fran Eldridge, Melanie Elliott, Jeanine

Fleury, Margaret Freund, Martin Gerard, Marschall Gilliland, Mary Gilliland, Bernie Gollop, Maddie Gollop, Mike Gollop, Jean Gordon, Bob Green, Kaija Harris, Tim Haughian, Marty Helgersen, John Horton, David Houston, Donald Houston, Mary Houston, Stuart Houston, Marlene Kalanack, Gordon Koshinsky, Margaret Koshinsky, Barbara Kozmyk, Gerard Lahey, Catherine Laratte, Anna Leighton, Ted Leighton, Louise Roy Mark, Edna McCawley, Terry McCawley, Shirley McKercher, David Miller, Kathryn Miller, Meewasin Valley Authority staff (2), Bob Nelson, Garth Nelson, Lillian Nelson, Bruce Noton, Hilda Noton, Lynn Oliver, Keith Pahl, Amanda Plante, Garry Rector, Wayne Renaud, Edith Riekman, Allan Rosenberg, Marella Rosta, Andy Salisbury, Craig Salisbury, Lorraine Salisbury, Rob Salisbury, Maureen Scarfe, Doug Schmeiser, Susan Skinner, Jim Smart, Al Smith, Janice Solem, Angela Stern, Martin Stoffel, Flo Turcot, Hilda Voth, Heather Wagg, Kirk Wallace, Jim Wedgwood, George West, Colette Wheler, *Michael Williams*, Ben Willson, Jennifer Willson, Kay Willson, Phil Willson, Jim Wood, Judy Wood, Lois Wooding, Dan Zazelenchuk, Norman Zlotkin.

79. SHAMROCK. *Hugh Henry*.

80. SKULL CREEK. Catherine Bennetto, *Eileen Bennetto*, Ray Bennetto, Sharon Bennetto, Tim Bennetto, Doris Bircham, Ralph Bircham, Greeba Drever, Betty Mann, Robert Mann, Joanne Peterson, Larry Petterson, Harvey Wasilow.

81. SNOWDEN. Bonny Bailey, Rita Birhenthal, Elenor and Mike Bodnaruk, *Irene Hagel*, Karen Hagel, Jenny Johnson, Ralph Johnson,

Violet Lien, Lorne Lindberg, Sharon Lindberg, Jack Pickett, Vera Schemenauer, Orville Shwetz, Vicky Shwetz, Bev Smears, Harold and Irene Thompson.

82.SPALDING. Bill Spizawka, Christina Spizawka, Jamie Spizawka, Kerry Spizawka, *Velma Spizawka*.

83.SPRUCE HOME. *Sharon and Tom Dice*.

84.SQUAW RAPIDS. Valeri Harris, *Wayne Harris*, Sheila Lamont, Guy Wapple.

85.SWIFT CURRENT. Evelyn Anderson, James Beattie, Noris Currie, Larry Dudragne, Hugh Henry, Jeff Jensen, Julie Jensen, *Ron Jensen*, Doreen Kreuger, Walt Kreuger, Arlene Lawson, Doug Lawson, Sue McAdam, Albert Otway, Ted Philipchuk, John Pound, Floyd Stinson, Irene Stinson, Kae Waters, John Weston, Pearl Weston, Verdella Zacharias.

86.TISDALE. George Curry, Marjorie Curry, Jenny Fretshaw, Vince Fretshaw, *Joyce Mohr*, Jim Wright, Mary Wright.

87.TOGO. Barb Elsasser, *Doug Elsasser*.

88.TURTLE LAKE. E.M. *Robinson*, Marie Robinson.

89.WALDHEIM. Barb Epp, Vicki Gossen.

90.WATSON. Doris Breker, Doreen MacDonald, Irene Sampson, *Patricia Sterzuk*, Doreen Weber.

91.WELDON. *Ada Hawrish*, Bernard Hawrish.

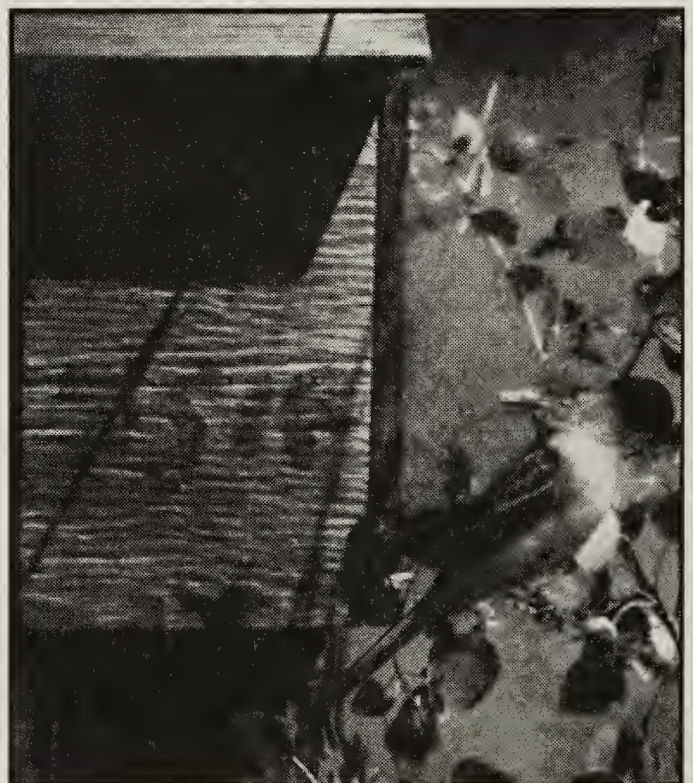
92.WELDON. *Carmen Hanson*.

93.WEYBURN. Leo Belanger, Sophie Belanger, Bob Cameron, Jeff Cameron, Lucille Cameron, Fred Garner, *Dick Gutfriend*, Kelly Kozij, Grace Kurtz, Cy Marcotte, Keith Sakatch, Norbert Schultz, Stewart Stairmand, Sid Trepoff.

94.WHITE BEAR. Darryl Jordheim, Floyd Jordheim, *Sig Jordheim*, Greg McCulloch, Keely McCulloch, Lynette McCulloch.

95.WHITEWOOD. Ellen Blyth, Stephen Ede, Tom Ede, Joyce Jordan, Wilfred Jordens, Bernice Juzyniec, Felix Juzyniec, Jean Meadows, *Boyd Metzler*, John Pollock, Alfred Pritchard, Florence Pritchard, Lenore Santo, Diane Veresh, Pat Ward, Jean Wilson, Edwin Wyatt, Elain Wyatt.

96.YORKTON. Bill Anaka, Joyce Anaka, Elinor Hjertaas, *Mark Kornder*, Boyd Metzlar, Ray Riesz, Geoff Rushowick, Patrick Rushowick, Dorothy Skene, Ed Skene, Harold Wilkinson.



Great Crested Flycatcher

Ray Pettinger

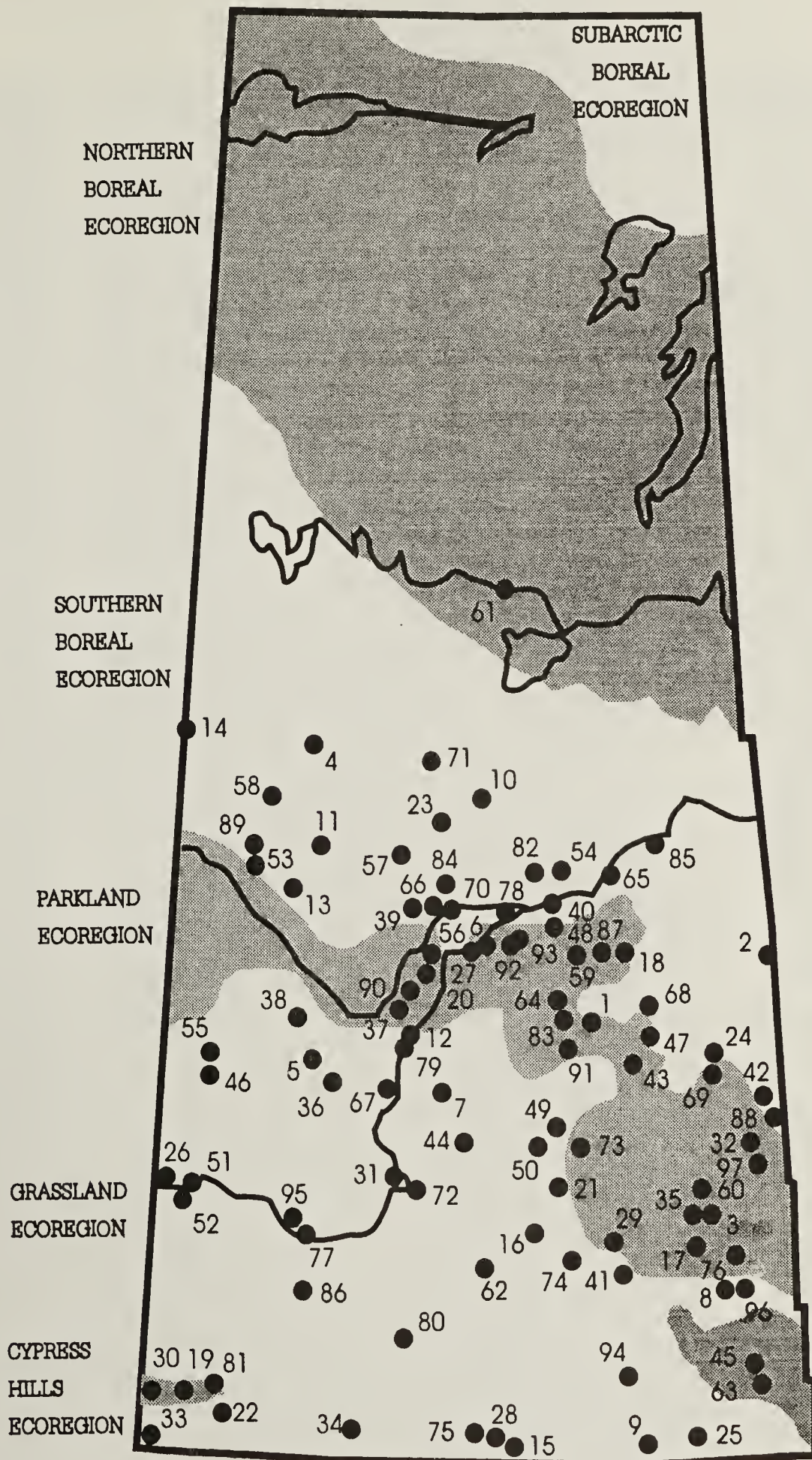


Figure 1.

Location of 1998 counts (numbers correspond to locality names in Tables)

Table 1-1: COUNT WEATHER CONDITIONS

COUNT		DATE	MINIMUM TEMPERATURE °C	MAXIMUM TEMPERATURE °C	MINIMUM WIND (kmph)	MAXIMUM WIND (kmph)	MINIMUM SNOW (cm)	MAXIMUM SNOW (cm)	SKY AM	SKY PM
1	ARCHERWILL	Dec. 29, 1998	-25	-22	0	5	8	10	clear	clear
2	ARMIT	Jan. 02, 1999	-30	-25	2	15	5	10	mostly clear	clear
3	BANGOR	Dec. 31, 1998	-32	-25	20	25	10	15	mostly clear	mostly clear
4	BEAUVAL	Jan. 03, 1999	-38	-23	0	4	38	45	mostly clear	overcast
5	BIGGAR	Dec. 27, 1998	-15	-12	0	16	0	8	partly cloudy	partly cloudy
6	BIRCH HILLS	Dec. 22, 1998	-22	-21	30	50	5	8	mostly clear	partly cloudy
7	BRIGHTWATER	Dec. 21, 1998	-25	-20	5	10	0	10	mostly clear	mostly clear
8	BROADVIEW	Dec. 26, 1998	-21	-15	5	10	3	8	partly cloudy	partly cloudy
9	BROMHEAD	Dec. 31, 1998	-25	-20	0	5	5	30	mostly clear	partly cloudy
10	CANDLE LAKE	Dec. 30, 1998	-22	-21	10	15	10	15	overcast	partly cloudy
11	CHITEK LAKE	Dec. 20, 1998	-28	-22	0	2	10	18	mostly clear	mostly clear
12	CLARK'S	Dec. 19, 1998	-20	-18	0	15	1	15	overcast	mostly clear
13	COCHIN	Dec. 27, 1998	-17	-15	2	5	5	10	partly cloudy	partly cloudy
14	COLD	Dec. 26, 1998	-17	-15	0	10	10	15	mostly clear	mostly clear
15	CORONACH	Dec. 23, 1998	-20	-16	15	35	0	2	clear	clear
16	CRAVEN	Dec. 19, 1998	-24	-20	10	15	20	45	clear	mostly clear
17	CROOKED LAKE	Dec. 21, 1998	-30	-25	30	40	10	13	clear	clear
18	CROOKED	Dec. 28, 1998	-25	-25	0	0	15	18	mostly clear	mostly clear
19	CYPRESS HILLS	Dec. 30, 1998	-16	-11	15	20	15	30	partly cloudy	mostly clear
20	DUCK LAKE	Dec. 29, 1998	-30	-20	0	5	0	20	mostly clear	partly cloudy
21	DUVAL	Dec. 28, 1998	-29	-22	0	9	0	15	clear	mostly clear
22	EASTEND	Dec. 29, 1998	-15	0	0	0	0	18	clear	clear
23	EMMA LAKE	Jan. 02, 1999	-27	-17	0	10	12	15	clear	partly cloudy
24	ENDEAVOUR	Dec. 22, 1998	-22	-19	15	20	15	25	heavy fog	light fog
25	ESTEVAN	Dec. 24, 1998	-20	-15	10	30	0	2	clear	clear
26	ESTUARY	Jan. 03, 1999	-23	-17	5	10	5	10	mostly clear	clear
27	FENTON	Dec. 21, 1998	-30	-22	20	30	8	10	mostly clear	mostly clear
28	FIFE LAKE	Dec. 29, 1998	-26	-20	2	15	0	10	mostly clear	mostly clear
29	FORT	Dec. 18, 1998	-18	-10	20	40	3	5	mostly clear	mostly clear
30	FORT WALSH	Dec. 19, 1998	-25	-20	16	40	0	25	partly cloudy	partly cloudy
31	GARDINER DAM	Dec. 21, 1998	-31	-25	16	30	0	7	clear	partly cloudy
32	GOOD SPIRIT	Jan. 03, 1998	-34	-24	5	15	8	25	clear	clear
33	GOVENLOCK	Dec. 20, 1998	-26	-15	5	25	0	0	clear	mostly clear
34	GRASSLANDS	Dec. 21, 1998	-25	-20	5	10	2	4	clear	
35	GRAYSON	Dec. 26, 1998	-21	-8	2	10	0	25	partly cloudy	partly cloudy
36	HARRIS	Dec. 23, 1998	-21	-18	0	10	4	6	mostly clear	partly cloudy
37	HEPBURN	Dec. 30, 1998	-21	-21	0	0	8	12	clear	clear
38	HERSCHAL	Dec. 29, 1998	-25	-20	0	20	0	10	partly cloudy	mostly clear
39	HOLBEIN	Dec. 27, 1998	-22	0	0	0	10	15	light fog	light fog
40	HORSESHOE	Jan. 01, 1998	-30	-21	0	0	2	10	mostly clear	clear
41	INDIAN HEAD	Dec. 27, 1998	-20	-15	10	15	25	30	mostly clear	mostly clear
42	KAMSACK	Dec. 26, 1998	-30	-28	40	50	30	60	clear	clear
43	KELVINGTON	Dec. 31, 1998	-21	-21	0	0	10	15		overcast
44	KENASTON	Dec. 21, 1998	-24	-15	5	10	0	0	mostly clear	partly cloudy
45	KENOSEE LAKE	Dec. 20, 1998	-26	-22	15	20	10	25		clear
46	KINDERSLEY	Dec. 26, 1998	-22	-18			0	1	partly cloudy	overcast
47	KINISTINO	Dec. 26, 1998	-27	-25	0	0	8	60	clear	clear
48	KINLOCH	Jan. 03, 1999	-31	-23	0	5	10	15	clear	mostly clear
49	KUTAWAGAN	Dec. 27, 1998	-19	-15	10	20	0	2	partly cloudy	overcast

Table 1-2: COUNT WEATHER CONDITIONS

COUNT	DATE	MINIMUM TEMPERATURE °C	MAXIMUM TEMPERATURE °C	MINIMUM WIND (kmph)	MAXIMUM WIND (kmph)	MINIMUM SNOW (cm)	MAXIMUM SNOW (cm)	SKY AM	SKY PM
50 LAST MTN. L.	Dec. 26, 1998	-24	-16	25	30	0	0	overcast	overcast
51 LEADER (N)	Dec. 26, 1998	-16	-8	10	20	0	20	partly cloudy	partly cloudy
52 LEADER (S)	Dec. 26, 1998	-20	-10	15	17	5	8	clear	clear
53 LIVELONG	Dec. 30, 1998	-20	-15	0	0	20	25	overcast	partly cloudy
54 LOVE-TORCH R.	Dec. 26, 1998	-23	-21	0	5	20	30	overcast	overcast
55 LUSELAND	Dec. 26, 1998	-14	-8	10	15	0	4	partly cloudy	partly cloudy
56 MACDOWALL	Dec. 25, 1998	-21	-18	0	6	1	3	mostly clear	partly cloudy
57 MAYVIEW	Dec. 23, 1998	-21	-21	20	20	15	15	partly cloudy	partly cloudy
58 MEADOW LAKE	Dec. 27, 1998	-18	-15	0	5	12	15	overcast	overcast
59 MELFORT	Dec. 28, 1998	-32	-28	0	5	0	5	partly cloudy	partly cloudy
60 MELVILLE	Dec. 26, 1998	-23	-18	10	10	5	30	clear	clear
61 MISSINIFE	Jan. 01, 1999	-32	-30	0	0	10	20	overcast	overcast
62 MOOSE JAW	Dec. 26, 1998	-14	-7	11	19	0	2	partly cloudy	overcast
63 MOOSE	Dec. 30, 1998	-18	-13	10	30	6	13	overcast	overcast
64 NAICAM	Dec. 31, 1998	-18	-12	0	5	25	30	partly cloudy	overcast
65 NIPAWIN	Dec. 29, 1998	-30	-30	0	5	8	10		clear
66 NISBET FOREST	Jan. 01, 1999	-20	-15	0	8	1	15	partly cloudy	mostly clear
67 PIKE LAKE	Jan. 02, 1998	-26	-23	0	10	10	25	clear	clear
68 PORCUPINE	Dec. 28, 1998	-28	-20	5	10	15	25	clear	clear
69 PREECEVILLE	Dec. 27, 1998	-15	-11	15	25	10	15	overcast	partly cloudy
70 PRINCE ALBERT	Dec. 20, 1998	-34	-27	10	15	8	15	clear	mostly clear
71 PRINCE ALBERT	Dec. 20, 1998	-34	-25	0	10	10	20	mostly clear	partly cloudy
72 QU'APPELLE V.	Dec. 20, 1998	-25	-23	5	15	5	20	mostly clear	mostly clear
73 RAYMORE	Dec. 25, 1998	-27	-16	15	50	0	5	clear	clear
74 REGINA	Dec. 26, 1998	-22	-8	0	10	0	4	mostly clear	overcast
75 ROCKGLEN	Jan. 02, 1999	-18	-16	15	20	25	30	clear	clear
76 ROUND LAKE	Dec. 19, 1998	-27	-16	0	15	6	8	mostly clear	mostly clear
77 SK. LANDING	Dec. 22, 1998	-22	-16	20	30	0	6	overcast	mostly clear
78 SK. RIVER	Dec. 23, 1998	-23	-22	15	25	5	10	clear	clear
79 SASKATOON	Dec. 26, 1998	-21	-12	0	15	2	10	overcast	partly cloudy
80 SHAMROCK	Dec. 22, 1998	-18	-16	40	55	2	6	clear	clear
81 SKULL CREEK	Dec. 26, 1998								
82 SNOWDEN	Dec. 30, 1998	-25	-16	0	0	4	15	overcast	clear
83 SPALDING	Dec. 27, 1998	-24	-18	0	0	16	20	clear	clear
84 SPRUCE HOME	Dec. 27, 1998	-30	-10	0	0	5	10	mostly clear	mostly clear
85 SQUAW RAPIDS	Jan. 02, 1999	-30	-27	10	20	20	30	overcast	partly cloudy
86 SWIFT CURRENT	Jan. 03, 1999	-21	-18	10	20	15	30	partly cloudy	partly cloudy
87 TISDALE	Jan. 02, 1999								
88 TOGO	Dec. 27, 1998	-28	-28	0	0	15	15		
89 TURTLE LAKE	Jan. 01, 1999	-30	-20	0	0	12	12		
90 WALDHEIM	Dec. 19, 1998	-25	-20			5	5		
91 WATSON	Jan. 03, 1999	-30	-27	0	0	8	25	clear	clear
92 WELDON - 1	Jan. 01, 1998	-30	-25	0	5	10	12	overcast	partly cloudy
93 WELDON - 2	Dec. 28, 1998	-25	-20	0	5	8	15	clear	clear
94 WEYBURN	Dec. 19, 1998	-23	-18	0	10	5	7	mostly clear	mostly clear
95 WHITE BEAR	Dec. 27, 1998	-12	-10	0	0	0	15	partly cloudy	mostly clear
96 WHITEWOOD	Dec. 27, 1998	-17	-13	10	15	10	20	mostly clear	mostly clear
97 YORKTON	Dec. 28, 1998	-28	-24	5	15	5	20	mostly clear	mostly clear

Table 2-1: COUNT COVERAGE

LOCALITY	EFFORT						HABITAT												
	# OBSERVERS	KM ON FOOT	HOURS ON FOOT	KM BY VEHICLE	HOURS BY VEHICLE	HOURS AT FEEDERS	EVERGREEN	MIXEDWOOD	DECIDUOUS	ASPEN/FARMLAND	ASPEN/PRAIRIE	PRAIRIE	TAME PASTURE	CULTIVATED	YARDS/SHELTERBELT	URBAN	OPEN WATER	LANDFILL	RIPARIAN
ARCHERWILL	6	4	2	20	2	6		10	15						60	15			
ARMIT	3	10	4	105	4		10	40	40	10									
BANGOR	1	2	1	10	2	4				25				25	50				
BEAUVAL	2						25	60	10				2	1	2				
BIGGAR	5	23.5	10.75	245	9.75	2				15				27	28	30			
BIRCH HILLS	3	2	1	98	4.5	3			4	30	5		5	40	10	5	1		
BRIGHTWATER	2	5	2.5	114	5.75				15		20	10	4	20	30		1		
BROADVIEW	7	4	1.5	160	5.5	2	1		14	20		15		30	10	10			
BROMHEAD	2	1	0.5	59	4.5									90	10				
CANDLE LAKE	4	4	2	158	4.5		20	50	20							10			
CHITEK LAKE	1	3	2	15	2.5	0.5	10	10		25						50		5	
CLARK'S CROSS.	29	31.6	20.9	525	26.6	7	1		2	12	10	3	2	11	14	19	2	4	10
COCHIN	3	2	0.75	90	5				10	60	5			20		5			
COLD L.-PIERCEL.	2	2	1.5	131	5	0.5		30						10	10	50			
CORONACH	3	1	1	180	7							10		60	5	5	20		
CRAVEN	11	5	3	377	19	2				10	15			35	10	25	5		
CROOKED LAKE	6	0.2	0.25	166	5.5	1.25			25	15					5	15		40	
CROOKED RIVER	2	1	1	50	1	2.5			33		33				34				
CYPRESS HILLS	11	15	4	30	4	3	60	20				10			10				
DUCK LAKE	2	10	4	105	4.5			65	5	15				4	1	10			
DUVAL	2	3	2	131	4	1			10	5	1	1		40	23	20			
EASTEND	2	4	3.25	40	3							15		30		55			
EMMA LAKE	4	1.5	1	55	3.5	4		95							5				
ENDEAVOUR	1	4	3	20	2			40		60									
ESTEVAN	3	5	3	145	7				20			20		20		20	20		
ESTUARY	2	5	3	120	3				25			45			30				
FENTON	2	2	0.75	130	4.75	1				10				75	10	5			
FIFE LAKE	2	1	0.75	100	4							5		30	20	5	40		
FORT QU'APPELLE	16	1	1	60	3	11		5	20		20	5		10	10	20	10		
FORT WALSH	10	50	24.5	123	11.5			33				2		4	4				57
GARDINER DAM	15	12.5	6.25	309	29.25					7				32	31		20		10
GOOD SPIRIT LAKE	5	1	0.5	108	5.5	0.5		2	3	5	20	40	2	5	20	2	1		
GOVENLOCK	9	16	8	300	13							50		25	25				
GRASSLANDS N.P.	9	3	1	150	8							80	10	5	5				
GRAYSON	4	7	2	50	3	1			20	30				15	20	5	10		
HARRIS	3	8	4	173	6.5					19				32	32	17			
HEPBURN	2	1	1	12	1	3				10						90			
HERSCHAL	2	6	2.5	225	4					45	10	5			5				35
HOLBEIN	2					8									100				
HORSESHOE BEND	4	1	3			1		10			10				80				
INDIAN HEAD	15	8	2	193	4	15				20	10		5	20	20	20	5		
KAMSACK	21														100				
KELVINGTON	3			62	2.5	5				30				60	10				
KENASTON	1	1	0.5	15	2	2				40				10	45	5			
KENOSEE LAKE	2			108	3.5	1			20	20						60			
KINDERSLEY	2			87	4								8	30	60	2			
KINISTINO	1	4	2	21	0.5	1									70	30			
KINLOCH	6	3	2	45	1.5	13	15	20	15	10					40				

Table 2-2: COUNT COVERAGE

LOCALITY	EFFORT						HABITAT												
	# OBSERVERS	KM ON FOOT	HOURS ON FOOT	KM BY VEHICLE	HOURS BY VEHICLE	HOURS AT FEEDERS	EVERGREEN	MIXEDWOOD	DECIDUOUS	ASPEN/FARMLAND	ASPEN/PRAIRIE	PRAIRIE	TAME PASTURE	CULTIVATED	YARDS/SHELTERBELT	URBAN	OPEN WATER	LANDFILL	RIPARIAN
KUTAWAGAN	3	2	1	210	8					20	10	10		40	10	10			
LAST MTN. L.	4	3	2	210	5					10		30		50	5	4	1		
LEADER (S)	2			270	6	3						50		30	10	10			
LIVELONG	1	4	2			4								20		80			
LOVE-TORCH R.	17	2	2	100	4	28		10		10				10	50	20			
LUSELAND	10	14	6	250	5	4				20	10	5	5	15	20	25			
MACDOWALL	1	2	2	25	2	2	10	10	10	50				10	10				
MAYVIEW	1							99							1				
MEADOW LAKE	7	9	4.5	135	4.5	8		20						15	30	35			
MELFORT	1	2	1			2								25	75				
MELVILLE	4	3	2	25	1.5	3				10				5	60	25			
MISSINIPÉ	1	3	2			3		28								72			
MOOSE JAW	28	13	7	82	4	7								10		45			45
MOOSE MOUNTAIN	3	4	1	182	4.5				40	20				15		25			
NAICAM	1					6									100				
NIPAWIN	9				3	3		80		10						10			
NISBET FOREST	4	5	1	100	4		10		30					40	10	10			
PIKE LAKE	37	46	20	334	12	4.9			15	10		5		15	15	40			
PORCUPINE PLAIN	1	1	1	60	4.5	1													
PREECEVILLE	9	9	6	142	5	16		25		50	20				5				
PRINCE ALBERT	24	19.5	4.3	560	20.8	25		20						5		75			
PRINCE ALBERT	21	35	19.5	69	3.5		20	50	20							5	5		
QU'APPELLE V.	4	4	3.6	211	5.1			1	15	10	5	4	15	20	20	5	5		
RAYMORE	4	5	3	231	7	1				70				10	10	10			
REGINA	30	69	28	741	26	3			8	3	5	6		30	22	26			
ROCKGLEN	1	1	1	80	4							20		70	10				
ROUND LAKE	5	1	0.5	228	10					40	10			25	5		20		
SK. LANDING P.P.	6	5	3	150	10							30		30	9		1		30
SK. RIVER FORKS	2	2.5	1.5	75	3.5		10	20	5	5			5	40	10		5		
SASKATOON	101	98	60	1052	63	97		1	4	12		1	1	9	12	58	2		
SHAMROCK	1			64	3.5								5	85	10				
SKULL CREEK	13																		
SNOWDEN	18	2.5	1.5	126	3.5	4		10						20	50	20			
SPALDING	5	1	0.5	45	3	3		40							20	40			
SPRUCE HOME	2					3		50		50									
SQUAW RAPIDS	4	20	8	130	8		10	60	10		10						10		
SWIFT CURRENT	22	24	12	346	15.5	17.5						2	2	80	5	10	1		
TISDALE	7					12								30	70				
TOGO	2					3					100								
TURTLE LAKE	2			106	5	6	25	25		25				25					
WALDHEIM	2			50	1	4								40		60			
WATSON	5	1	1	73	3.75	2			25		25			25	15	10			
WELDON - 1	2					7					40				60				
WELDON - 2	1	3	2	55	2	1		50		25					25				
WEYBURN	13	7	3	295	4	1						5		50	10	35			
WHITE BEAR	6	22	8	48	1.5									15	5				80
WHITEWOOD	21	12	8.5	381	11.5	24				25				5	20	50			
YORKTON	11	5	2	151	8	1				50						50			

Table 3-1. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY and DATE	ARCHERWILL December 29, 1998	ARMIT January 02, 1999	BANGOR December 31, 1998	BEAUVAL January 03, 1999	BIGGAR December 27, 1998	BIRCH HILLS December 22, 1998	BRIGHTWATER RES. December 21, 1998	BROADVIEW December 26, 1998	BROMHEAD December 31, 1998	CANDLE LAKE December 30, 1998
CANADA GOOSE											
MALLARD								114			
COMMON GOLDENEYE											
BALD EAGLE		2									
NORTHERN GOSHAWK					1	1					1
GOLDEN EAGLE								1		1	
MERLIN						1			+		
GRAY PARTRIDGE						12	39	14			
RING-NECKED PHEASANT										42	
RUFFED GROUSE		1	6	+	2		1		2		
SHARP-TAILED GROUSE		3	17	+		75		34	26	2	3
ROCK DOVE				5		104	92	32	8	16	
GREAT HORNED OWL					+	6	1		1	1	
SNOWY OWL						1				2	
SHORT-EARED OWL										1	
DOWNY WOODPECKER		6	2	2	1	5	4	1	1		1
HAIRY WOODPECKER		5	7	3	4	3	8	1	5		1
BLACK-BACKED WOODPECKER			1								1
NORTHERN FLICKER (Y-s)											
PILEATED WOODPECKER											
HORNED LARK								18		805	
GRAY JAY		1	13		7						9
BLUE JAY		28	8	2	10	2	1	2			2
BLACK-BILLED MAGPIE		11	37	3	57	202	53	40	45	5	24
COMMON RAVEN		8	27	2	50	15	24	7	49		137
BLACK-CAPPED CHICKADEE		79	24	15	10	43	36	4	26		19
BOREAL CHICKADEE			4		1	2					10
RED-BREASTED NUTHATCH		8	1			5					
WHITE-BREASTED NUTHATCH									3		
GOLDEN-CROWNED KINGLET						3					
AMERICAN ROBIN						2					
BOHEMIAN WAXWING				+		381	13		200		
NORTHERN SHRIKE						1					
EUROPEAN STARLING						3					
WHITE-THROATED SPARROW							1				
DARK-EYED JUNCO (S-c)				+		2	1				
SNOW BUNTING		37	5061	50		1231	346	2	1	3112	
PINE GROSBEAK		43		2	64	3					8
HOUSE FINCH						1					
RED CROSSBILL				15		3					
COMMON REDPOLL		27	60	9	22	645	13		1		
HOARY REDPOLL			3		3	7					
PINE SISKIN						5					
EVENING GROSBEAK		55	11		60						
HOUSE SPARROW		58	2			881	124	184	122	28	
INDIVIDUALS IN TABLES 4 & 5		1	5	0	2	2	0	0	3	1298	2
SPECIES IN TABLES 4 & 5		2	4	1	2	2	0	0	1	1	1
INDIVIDUALS ON COUNT DAY		373	5289	108	294	3647	757	454	493	5313	218
SPECIES ON COUNT DAY		17	21	11	16	31	16	14	15	12	13
SPECIES COUNT PERIOD		18	21	16	17	31	16	14	16	12	13

Table 3-2. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

CHITEK LAKE December 20, 1998	CLARK'S CROSSING December 19, 1998	COCHIN December 27, 1998	COLD L.-PIERCEL. December 26, 1998	CORONACH December 23, 1998	CRAVEN December 19, 1998	CROOKED LAKE December 21, 1998	CROOKED RIVER December 28, 1998	CYPRESS HILLS P.P. December 30, 1998	DUCK LAKE December 29, 1998	LOCALITY and DATE	SPECIES
	125			492							CANADA GOOSE
				13700		263					MALLARD
	1			31	17	10					COMMON GOLDENEYE
	1			1		1					BALD EAGLE
								1			NORTHERN GOSHAWK
		1		2	1						GOLDEN EAGLE
	1				1						MERLIN
	212	27									GRAY PARTRIDGE
				11				1			RING-NECKED PHEASANT
	1	2			+		2		1		RUFFED GROUSE
	43	5		2	14		4		1		SHARP-TAILED GROUSE
	178	6	7	24	54	22			10		ROCK DOVE
	1	1			1	1		1			GREAT HORNED OWL
	4				2		+				SNOWY OWL
											SHORT-EARED OWL
3	6	1	1		12	2	2	5	2		DOWNY WOODPECKER
1	9		2		4	1	2	4	1		HAIRY WOODPECKER
1									1		BLACK-BACKED WOODPECKER
											NORTHERN FLICKER (Y-s)
		1							1		PILEATED WOODPECKER
		17		134							HORNED LARK
2		2	+						1		GRAY JAY
3	1		8		12	13	6	1			BLUE JAY
14	339	12	44	27	98	49	20	59	13		BLACK-BILLED MAGPIE
127	31	6	255			2	38	14	28		COMMON RAVEN
20	71	3	29		50	44	9	86	1		BLACK-CAPPED CHICKADEE
5			2								BOREAL CHICKADEE
			2					6			RED-BREASTED NUTHATCH
					7	1					WHITE-BREASTED NUTHATCH
			2								GOLDEN-CROWNED KINGLET
	1				+						AMERICAN ROBIN
	224	150		16	584	16		5			BOHEMIAN WAXWING
					1	1	+				NORTHERN SHRIKE
	50		17	5							EUROPEAN STARLING
	1					1					WHITE-THROATED SPARROW
	1				2		1	1			DARK-EYED JUNCO (S-c)
	1656	45		40	26	150	50		75		SNOW BUNTING
21	4		42				34				PINE GROSBEAK
	2				6						HOUSE FINCH
								22			RED CROSSBILL
8	267		50		7	680					COMMON REDPOLL
	17										HOARY REDPOLL
					1						PINE SISKIN
5			2				11	2	4		EVENING GROSBEAK
	2156	13	54	558	393	371	23		13		HOUSE SPARROW
0	1	0	19	57	5	2	0	2	2		INDIVIDUALS IN TABLES 4 & 5
0	1	0	2	6	5	2	0	3	1		SPECIES IN TABLES 4 & 5
210	5404	292	536	15100	1298	1630	202	210	154		INDIVIDUALS ON COUNT DAY
12	28	16	17	20	24	20	13	16	15		SPECIES ON COUNT DAY
12	28	16	18	20	28	20	15	17	15		SPECIES COUNT PERIOD

Table 3-3. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY and DATE	DUVAL December 28, 1998	EASTEND December 29, 1998	EMMA LAKE January 02, 1999	ENDEAVOUR December 22, 1998	ESTEVAN December 24, 1998	ESTUARY January 03, 1999	FENTON December 21, 1998	FIFE LAKE December 29, 1998	FORT QU'APPELLE December 18, 1998
CANADA GOOSE						701			349	549
MALLARD						241			1543	95
COMMON GOLDENEYE						2			36	31
BALD EAGLE									2	3
NORTHERN GOSHAWK							1			
GOLDEN EAGLE		+	+		+	1			3	1
MERLIN			1							
GRAY PARTRIDGE		8					13		33	
RING-NECKED PHEASANT			4			11	7			+
RUFFED GROUSE		1			1			1		1
SHARP-TAILED GROUSE					11		44		34	
ROCK DOVE		35			+	2	25	16	10	2
GREAT HORNED OWL		3	2		+			1		+
SNOWY OWL		1							2	+
SHORT-EARED OWL										
DOWNY WOODPECKER		10	3	4	1	3		5		13
HAIRY WOODPECKER		5	3	3	1	2	1	5		11
BLACK-BACKED WOODPECKER				+	+					
NORTHERN FLICKER (Y-s)							2			
PILEATED WOODPECKER										
HORNED LARK		3	135				185		1596	
GRAY JAY				4						
BLUE JAY		12	1	9	3		9	2		33
BLACK-BILLED MAGPIE		22	31	2	2	29	52	46	4	14
COMMON RAVEN		4		124	80			16		3
BLACK-CAPPED CHICKADEE		31	20	99	9	35	13	21		133
BOREAL CHICKADEE				32						
RED-BREASTED NUTHATCH				3						3
WHITE-BREASTED NUTHATCH				9	2					17
GOLDEN-CROWNED KINGLET										
AMERICAN ROBIN										1
BOHEMIAN WAXWING		26	54			60	269	1		604
NORTHERN SHRIKE			2			1				+
EUROPEAN STARLING		3				18				+
WHITE-THROATED SPARROW										+
DARK-EYED JUNCO (S-c)			1				3			1
SNOW BUNTING					100		20	130		
PINE GROSBEAK				12	17		29			
HOUSE FINCH										1
RED CROSSBILL										
COMMON REDPOLL				12	6	2		65		8
HOARY REDPOLL								+		
PINE SISKIN							1			
EVENING GROSBEAK					17					+
HOUSE SPARROW		485	90	10		33	86	13		131
INDIVIDUALS IN TABLES 4 & 5		0	1	0	1	35	8	0	128	8
SPECIES IN TABLES 4 & 5		0	1	0	1	5	3	0	3	11
INDIVIDUALS ON COUNT DAY		649	348	323	251	1176	768	322	3740	1663
SPECIES ON COUNT DAY		15	14	13	14	20	19	13	14	28
SPECIES COUNT PERIOD		16	15	14	18	20	19	14	14	39

Table 3-4. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

FORT WALSH December 19, 1998	GARDINER DAM December 21, 1998	GOOD SPIRIT LAKE January 03, 1998	GOVENLOCK December 20, 1998	GRASSLANDS N.P. December 21, 1998	GRAYSON December 26, 1998	HARRIS December 23, 1998	HEPBURN December 30, 1998	HERSCHAL December 29, 1998	LOCALITY and DATE SPECIES
2	251								CANADA GOOSE
19	2219				12				MALLARD
	53				4				COMMON GOLDENEYE
+	20		2		1	1			BALD EAGLE
1									NORTHERN GOSHAWK
2	5							2	GOLDEN EAGLE
1									MERLIN
22	45	+	22			78		6	GRAY PARTRIDGE
4			22	7					RING-NECKED PHEASANT
1		2			1				RUFFED GROUSE
5	37		23	57		3			SHARP-TAILED GROUSE
	30	7			27	178		84	ROCK DOVE
2	9	2	5	1		1		5	GREAT HORNED OWL
	3		+			1		14	SNOWY OWL
			7						SHORT-EARED OWL
4		4			3	2	1		DOWNY WOODPECKER
1	1	7			1		1		HAIRY WOODPECKER
									BLACK-BACKED WOODPECKER
									NORTHERN FLICKER (Y-s)
									PILEATED WOODPECKER
11	10		276	302		20		23	HORNED LARK
									GRAY JAY
	6	2			2		3		BLUE JAY
132	194	19	25	37	24	116	3	75	BLACK-BILLED MAGPIE
1		21			4	1	+		COMMON RAVEN
52	7	37	1		23	10	5	3	BLACK-CAPPED CHICKADEE
									BOREAL CHICKADEE
1									RED-BREASTED NUTHATCH
		4			3				WHITE-BREASTED NUTHATCH
2						1			GOLDEN-CROWNED KINGLET
					1				AMERICAN ROBIN
27	27		2			17			BOHEMIAN WAXWING
1				1					NORTHERN SHRIKE
3			3						EUROPEAN STARLING
									WHITE-THROATED SPARROW
						5	1		DARK-EYED JUNCO (S-c)
114	273		161		71	32	+	1354	SNOW BUNTING
23	3	14							PINE GROSBEAK
									HOUSE FINCH
1									RED CROSSBILL
122	6		15			3		109	COMMON REDPOLL
3									HOARY REDPOLL
									PINE SISKIN
	5								EVENING GROSBEAK
150	468	68	210		15	875	12	149	HOUSE SPARROW
70	245	0	24	1	1	1	0	0	INDIVIDUALS IN TABLES 4 & 5
14	9	0	4	1	1	1	0	0	SPECIES IN TABLES 4 & 5
777	3917	187	798	406	193	1345	26	1824	INDIVIDUALS ON COUNT DAY
38	28	12	18	7	16	18	7	11	SPECIES ON COUNT DAY
40	28	13	19	7	16	18	9	11	SPECIES COUNT PERIOD

Table 3-5. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES

(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY and DATE	HOLBEIN December 27, 1998	HORSESHOE BEND January 01, 1998	INDIAN HEAD December 27, 1998	KAMSACK December 26, 1998	KELVINGTON December 31, 1998	KENASTON December 21, 1998	KENOSEE LAKE December 20, 1998	KINDERSLEY December 26, 1998	KINISTINO December 29, 1998	KINLOCH January 03, 1999
CANADA GOOSE				18							
MALLARD				70							
COMMON GOLDENEYE				15							
BALD EAGLE				4	1						
NORTHERN GOSHAWK				1							
GOLDEN EAGLE							+		+		
MERLIN				1							
GRAY PARTRIDGE				12		8	14		8		
RING-NECKED PHEASANT											
RUFFED GROUSE						+		1			+
SHARP-TAILED GROUSE				17		+	18		12		
ROCK DOVE				49		5	24		17	21	+
GREAT HORNED OWL				2					1		+
SNOWY OWL									+		
SHORT-EARED OWL											
DOWNY WOODPECKER	2		7	1	3	1	5				5
HAIRY WOODPECKER	3		7	3	4	+	7				6
BLACK-BACKED WOODPECKER											
NORTHERN FLICKER (Y-s)											
PILEATED WOODPECKER					3						+
HORNED LARK							3		9		
GRAY JAY		5									6
BLUE JAY	4	5	8	62	7	4	20				18
BLACK-BILLED MAGPIE	1	8	72	6	14	12	27	25	4	9	
COMMON RAVEN	1	8	31	4	28	2	9		2	18	
BLACK-CAPPED CHICKADEE	8	14	70	63	32	4	139		3	36	
BOREAL CHICKADEE	1	2									+
RED-BREASTED NUTHATCH			18	2							2
WHITE-BREASTED NUTHATCH	1		8	4			8				7
GOLDEN-CROWNED KINGLET			2				1				
AMERICAN ROBIN			2								
BOHEMIAN WAXWING			1500	10	+	56					
NORTHERN SHRIKE				1							1
EUROPEAN STARLING											
WHITE-THROATED SPARROW											
DARK-EYED JUNCO (S-c)	2			38	2						
SNOW BUNTING		50	51	100	200	49		+		90	
PINE GROSBEAK		21		43			2				31
HOUSE FINCH											
RED CROSSBILL											
COMMON REDPOLL	12	23	2	45	80	32					23
HOARY REDPOLL	10		20								
PINE SISKIN		4	20	10	+		44				
EVENING GROSBEAK	35			270			45				10
HOUSE SPARROW			80	100		34	10	45	71	22	
INDIVIDUALS IN TABLES 4 & 5	0	1	4	2	0	1	19	0	4	0	
SPECIES IN TABLES 4 & 5	0	1	4	2	0	1	2	0	1	0	
INDIVIDUALS ON COUNT DAY	80	141	2091	768	383	254	337	117	105	284	
SPECIES ON COUNT DAY	12	11	30	21	11	14	15	7	6	15	
SPECIES COUNT PERIOD	12	11	30	21	15	16	15	10	6	20	

Table 3-6. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(± = species seen during the count period but not on count day)

KUTAWAGAN LAKE December 27, 1998	LAST MTN. L. W.M.A.	LEADER (N) December 26, 1998	LEADER (S) December 26, 1998	LIVELONG December 30, 1998	LOVE-TORCH R. December 26, 1998	LUSELAND December 26, 1998	MACDOWALL December 25, 1998	MAYVIEW December 23, 1998	LOCALITY and DATE SPECIES
									CANADA GOOSE
									MALLARD
									COMMON GOLDENEYE
			1						BALD EAGLE
					1				NORTHERN GOSHAWK
		1			+	1			GOLDEN EAGLE
									MERLIN
+	16	10	12			46			GRAY PARTRIDGE
		30	4						RING-NECKED PHEASANT
				5	8		1		RUFFED GROUSE
25	4	2							SHARP-TAILED GROUSE
4	256		30	40	+	119	25		ROCK DOVE
+	1					2			GREAT HORNED OWL
3	2		2						SNOWY OWL
	3		2			1			SHORT-EARED OWL
	1	1	1	2	8	+	2		DOWNY WOODPECKER
			1	6	10	+	2		HAIRY WOODPECKER
									BLACK-BACKED WOODPECKER
						+			NORTHERN FLICKER (Y-s)
					2				PILEATED WOODPECKER
			3			6			HORNED LARK
					14				GRAY JAY
			2	8	28	3	4	2	BLUE JAY
95	63	17	85		30	53	4	10	BLACK-BILLED MAGPIE
				25	83	+	6	2	COMMON RAVEN
10			4	20	56	4	25	6	BLACK-CAPPED CHICKADEE
								1	BOREAL CHICKADEE
					3	+		1	RED-BREASTED NUTHATCH
					9			3	WHITE-BREASTED NUTHATCH
						+			GOLDEN-CROWNED KINGLET
									AMERICAN ROBIN
26	65			+		17			BOHEMIAN WAXWING
									NORTHERN SHRIKE
			1						EUROPEAN STARLING
									WHITE-THROATED SPARROW
					+			+	DARK-EYED JUNCO (S-c)
31	5541	+			340	355			SNOW BUNTING
				35	48		15	3	PINE GROSBEAK
									HOUSE FINCH
						5			RED CROSSBILL
20	+	12		30	65	137	2		COMMON REDPOLL
									HOARY REDPOLL
									PINE SISKIN
				10	10		2		EVENING GROSBEAK
567	446	8	216	20	151	394			HOUSE SPARROW
1	1	0	6	0	7	2	2	2	INDIVIDUALS IN TABLES 4 & 5
1	1	2	3	0	3	2	1	1	SPECIES IN TABLES 4 & 5
782	6399	81	370	201	873	1145	90	30	INDIVIDUALS ON COUNT DAY
10	12	8	17	11	19	16	12	9	SPECIES ON COUNT DAY
12	13	11	17	12	23	22	12	10	SPECIES COUNT PERIOD

Table 3-7. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY and DATE	MEADOW LAKE December 27, 1998	MELFORT December 28, 1998	MELVILLE December 26, 1998	MISSINUIPE January 01, 1999	MOOSE JAW December 26, 1998	MOOSE MOUNTAIN December 30, 1998	NAICAM December 31, 1998	NIPAWIN December 29, 1998	NISBET FOREST January 01, 1999
CANADA GOOSE										
MALLARD										
COMMON GOLDENEYE										
BALD EAGLE									+	
NORTHERN GOSHAWK										
GOLDEN EAGLE										
MERLIN						1				
GRAY PARTRIDGE						8				
RING-NECKED PHEASANT						1				
RUFFED GROUSE										3
SHARP-TAILED GROUSE		22								
ROCK DOVE		160		30		150	16			
GREAT HORNED OWL			1	1		1				+
SNOWY OWL						1				
SHORT-EARED OWL										
DOWNY WOODPECKER		3	1	2		4	10	2	2	1
HAIRY WOODPECKER		2		2	1	4	5	2	2	2
BLACK-BACKED WOODPECKER										
NORTHERN FLICKER (Y-s)						2				
PILEATED WOODPECKER										+
HORNED LARK						40				
GRAY JAY		3			2					2
BLUE JAY		6	3	1	3		35	2	4	14
BLACK-BILLED MAGPIE		17	5	4		47	112	4	7	24
COMMON RAVEN		65	4	2			10	2	126	13
BLACK-CAPPED CHICKADEE		34	2	18	2	35	130	6	6	12
BOREAL CHICKADEE					1				2	
RED-BREASTED NUTHATCH		1				24			2	
WHITE-BREASTED NUTHATCH		1				2	1			2
GOLDEN-CROWNED KINGLET										
AMERICAN ROBIN						2				
BOHEMIAN WAXWING		7				45			8	
NORTHERN SHRIKE										
EUROPEAN STARLING							8			
WHITE-THROATED SPARROW						2				
DARK-EYED JUNCO (S-c)						7				
SNOW BUNTING		55					1		55	530
PINE GROSBEAK		64				1			2	38
HOUSE FINCH						92				
RED CROSSBILL		4								
COMMON REDPOLL		100							+	9
HOARY REDPOLL		4								1
PINE SISKIN				3		30	27			
EVENING GROSBEAK		33			+		10		20	22
HOUSE SPARROW		277	150	60		362	94	15		47
INDIVIDUALS IN TABLES 4 & 5		0	0	0	0	1	4	0	0	0
SPECIES IN TABLES 4 & 5		0	0	0	0	1	2	0	1	0
INDIVIDUALS ON COUNT DAY		858	166	123	9	862	463	33	236	720
SPECIES ON COUNT DAY		19	7	10	5	23	15	7	12	15
SPECIES COUNT PERIOD		19	7	10	6	23	15	7	15	17

Table 3-8. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

PIKE LAKE January 02, 1998	PORCUPINE PLAIN December 28, 1998	PREECEVILLE December 27, 1998	PRINCE ALBERT December 20, 1998	PRINCE ALBERT N.P. December 20, 1998	QU'APPELLE V. DAM December 20, 1998	RAYMORE December 25, 1998	REGINA December 26, 1998	ROCKGLEN January 02, 1999	LOCALITY and DATE SPECIES
					905		+		CANADA GOOSE
					380	1	6		MALLARD
					24				COMMON GOLDENEYE
					2				BALD EAGLE
1		1	1						NORTHERN GOSHAWK
					2			1	GOLDEN EAGLE
			2			1	1		MERLIN
3						17	121	42	GRAY PARTRIDGE
							3		RING-NECKED PHEASANT
1		2	8	12		2			RUFFED GROUSE
39			13		29	7	34	49	SHARP-TAILED GROUSE
39		23	286		22	11	563		ROCK DOVE
2					2	1	9		GREAT HORNED OWL
						+	8		SNOWY OWL
								+	SHORT-EARED OWL
21		9	19			2	22		DOWNY WOODPECKER
39	1	7	18	3		2	5		HAIRY WOODPECKER
				2					BLACK-BACKED WOODPECKER
3							2		NORTHERN FLICKER (Y-s)
1	1		2	2					PILEATED WOODPECKER
1						1		268	HORNED LARK
		7	15	7					GRAY JAY
40		8	28	1	4		6		BLUE JAY
217	2	41	133	1	48	77	258	11	BLACK-BILLED MAGPIE
40	4	52	226	11	1	17			COMMON RAVEN
357	9	46	119	14	3	21	40	+	BLACK-CAPPED CHICKADEE
		5	4	28					BOREAL CHICKADEE
2		2	4				31		RED-BREASTED NUTHATCH
7	1	6	11				9		WHITE-BREASTED NUTHATCH
							5		GOLDEN-CROWNED KINGLET
3							3		AMERICAN ROBIN
161			256		24	7	1133	6	BOHEMIAN WAXWING
1		2				+			NORTHERN SHRIKE
						21	108		EUROPEAN STARLING
			1				1		WHITE-THROATED SPARROW
6						2	15		DARK-EYED JUNCO (S-c)
199		143	71			2	625		SNOW BUNTING
6	5	26	79			2			PINE GROSBEAK
							190		HOUSE FINCH
				2			+		RED CROSSBILL
94	3	34	159	5		3			COMMON REDPOLL
									HOARY REDPOLL
2							95		PINE SISKIN
3	10	45	48			2			EVENING GROSBEAK
353	15	42	316		315	430	1097		HOUSE SPARROW
10	0	1	0	2	25	0	45	6	INDIVIDUALS IN TABLES 4 & 5
4	0	1	1	1	2	1	10	4	SPECIES IN TABLES 4 & 5
1651	51	502	1819	90	1786	629	4435	383	INDIVIDUALS ON COUNT DAY
31	10	20	23	13	16	21	33	8	SPECIES ON COUNT DAY
31	10	20	24	13	16	24	37	12	SPECIES COUNT PERIOD

Table 3-9. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES

(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY and DATE	ROUND LAKE December 19, 1998	SK. LANDING P.P. December 22, 1998	SK. RIVER FORKS December 23, 1998	SASKATOON December 26, 1998	SHAMROCK December 22, 1998	SKULL CREEK December 26, 1998	SNOWDEN December 30, 1998	SPALDING December 27, 1998	SPRUCE HOME December 27, 1998
CANADA GOOSE		2			63					
MALLARD		83	7		59					
COMMON GOLDENEYE		10			71					
BALD EAGLE		1	+		+		2			
NORTHERN GOSHAWK										
GOLDEN EAGLE		3	1							
MERLIN					4					
GRAY PARTRIDGE			18		39	9		15		
RING-NECKED PHEASANT							7			
RUFFED GROUSE		1		1	1			24	1	
SHARP-TAILED GROUSE		1	26		30		17			
ROCK DOVE		3	2		2090		3	15	6	
GREAT HORNED OWL		1	2		2		1			
SNOWY OWL					1					
SHORT-EARED OWL										
DOWNY WOODPECKER		7	1	2	35		5	8		2
HAIRY WOODPECKER		11		2	33		3	11	1	2
BLACK-BACKED WOODPECKER								1		
NORTHERN FLICKER (Y-s)					20		2			
PILEATED WOODPECKER								1		
HORNED LARK			346			216	99			
GRAY JAY					2			13		
BLUE JAY		9		2	111		3	28	+	
BLACK-BILLED MAGPIE		60	66	27	976	3	88	37	4	1
COMMON RAVEN		12		12	41			172	6	1
BLACK-CAPPED CHICKADEE		138	15	23	640		38	123	4	12
BOREAL CHICKADEE				7				13		
RED-BREASTED NUTHATCH		1			74			1		
WHITE-BREASTED NUTHATCH		8		1	10			1		
GOLDEN-CROWNED KINGLET		2			6					
AMERICAN ROBIN					8					
BOHEMIAN WAXWING		35			9974		70			
NORTHERN SHRIKE					3					
EUROPEAN STARLING					40					
WHITE-THROATED SPARROW					2					
DARK-EYED JUNCO (S-c)					41		1			
SNOW BUNTING			505	220	137		45	3		1
PINE GROSBEAK				10	14			103		5
HOUSE FINCH					76					
RED CROSSBILL					67					
COMMON REDPOLL		275	23	30	199		26	210		18
HOARY REDPOLL					1					
PINE SISKIN					78			9		
EVENING GROSBEAK		2						63		
HOUSE SPARROW		52	264	33	3567	62	89	50	40	
INDIVIDUALS IN TABLES 4 & 5		4	253	0	83	0	23	0	0	0
SPECIES IN TABLES 4 & 5		2	4	0	10	0	3	1	0	0
INDIVIDUALS ON COUNT DAY		721	1529	370	18598	290	522	901	62	42
SPECIES ON COUNT DAY		24	16	13	44	4	20	21	7	8
SPECIES COUNT PERIOD		24	18	13	45	4	20	22	8	8

Table 3-10. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

SQUAW RAPIDS January 02, 1999	SWIFT CURRENT January 03, 1999	TISDALE January 02, 1999	TOGO December 27, 1998	TURTLE LAKE January 01, 1999	WALDHEIM December 19, 1998	WATSON January 03, 1999	WELDON - 1 January 01, 1998	WELDON - 2 December 28, 1998	LOCALITY and DATE SPECIES
									CANADA GOOSE
2	2								MALLARD
255									COMMON GOLDENEYE
5							1		BALD EAGLE
2									NORTHERN GOSHAWK
				1					GOLDEN EAGLE
									MERLIN
	56	7							GRAY PARTRIDGE
	7								RING-NECKED PHEASANT
7			3	10			1		RUFFED GROUSE
31	31			3	18	8			SHARP-TAILED GROUSE
	317				11				ROCK DOVE
1	1			1				1	GREAT HORNED OWL
	+			1	+				SNOWY OWL
									SHORT-EARED OWL
2	5	3	2	3	1		2		DOWNY WOODPECKER
3		3	3	4	2		2		HAIRY WOODPECKER
1									BLACK-BACKED WOODPECKER
	1								NORTHERN FLICKER (Y-s)
4				1					PILEATED WOODPECKER
	444			4					HORNED LARK
15		1		2				+	GRAY JAY
9		5		10	6		4	1	BLUE JAY
35	108	10	1	7	40	4	1	6	BLACK-BILLED MAGPIE
46		5	3	30	13	2	3	3	COMMON RAVEN
23	5	25	8	7	12	10	8	30	BLACK-CAPPED CHICKADEE
7				6					BOREAL CHICKADEE
	6			1					RED-BREASTED NUTHATCH
	+		1	3			2		WHITE-BREASTED NUTHATCH
									GOLDEN-CROWNED KINGLET
	1				+				AMERICAN ROBIN
	438				+				BOHEMIAN WAXWING
									NORTHERN SHRIKE
									EUROPEAN STARLING
									WHITE-THROATED SPARROW
	1			2					DARK-EYED JUNCO (S-c)
70	340	16	12	3		40			SNOW BUNTING
		9		30		+	10		PINE GROSBEAK
	10								HOUSE FINCH
					8				RED CROSSBILL
30		27					30		COMMON REDPOLL
4		2							HOARY REDPOLL
	22				+				PINE SISKIN
		7		5			12		EVENING GROSBEAK
15	1995			25	60	20		35	HOUSE SPARROW
11	37	7	0	4	1	0	0	1	INDIVIDUALS IN TABLES 4 & 5
4	2	1	0	2	1	0	0	1	SPECIES IN TABLES 4 & 5
578	3827	127	33	163	172	84	76	77	INDIVIDUALS ON COUNT DAY
25	21	14	8	24	11	6	12	7	SPECIES ON COUNT DAY
25	23	14	8	24	15	7	12	8	SPECIES COUNT PERIOD

Table 3-11. SPECIES RECORDED FROM MORE THAN EIGHT LOCALITIES
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY and DATE	WEYBURN December 19, 1998	WHITE BEAR December 27, 1998	WHITEWOOD December 27, 1998	YORKTON December 28, 1998	Total Individuals on Count Day	Number of Counts on Count Day	Number of Counts During Count Period
CANADA GOOSE						3457	11	12
MALLARD					20	18836	19	19
COMMON GOLDENEYE						560	14	14
BALD EAGLE						51	18	22
NORTHERN GOSHAWK						13	12	12
GOLDEN EAGLE		1	1			32	20	26
MERLIN		2		1	2	20	14	15
GRAY PARTRIDGE		37	43			1072	34	36
RING-NECKED PHEASANT		1				162	16	17
RUFFED GROUSE				3		121	36	40
SHARP-TAILED GROUSE		31	35	21		966	46	48
ROCK DOVE		109	51	61	191	5723	57	60
GREAT HORNED OWL		4	1	2		85	41	47
SNOWY OWL		1	1		1	51	19	26
SHORT-EARED OWL			+			14	5	7
DOWNY WOODPECKER		2	+	14	3	344	73	75
HAIRY WOODPECKER		3		14	4	348	71	73
BLACK-BACKED WOODPECKER						8	7	9
NORTHERN FLICKER (Y-s)						32	7	8
PILEATED WOODPECKER						19	11	13
HORNED LARK		5	21	5		5006	30	30
GRAY JAY						133	22	24
BLUE JAY		2	3	4	2	710	69	70
BLACK-BILLED MAGPIE		36	47	161	24	5264	95	95
COMMON RAVEN				48	35	2298	69	71
BLACK-CAPPED CHICKADEE		10	1	227	61	3836	88	89
BOREAL CHICKADEE						133	19	20
RED-BREASTED NUTHATCH		2		+		206	26	28
WHITE-BREASTED NUTHATCH		3		13	1	169	34	35
GOLDEN-CROWNED KINGLET		1				25	10	11
AMERICAN ROBIN		1				25	11	13
BOHEMIAN WAXWING		1	+	40	986	17541	41	46
NORTHERN SHRIKE						16	12	15
EUROPEAN STARLING		37	2	28		347	16	17
WHITE-THROATED SPARROW		2		1		12	9	10
DARK-EYED JUNCO (S-c)		5		3		144	24	27
SNOW BUNTING		406	+	173		24596	57	61
PINE GROSBEAK		12				933	40	41
HOUSE FINCH		5		8		391	10	10
RED CROSSBILL		30				157	10	11
COMMON REDPOLL			+	44		3939	54	57
HOARY REDPOLL						75	12	13
PINE SISKIN				3	10	364	17	19
EVENING GROSBEAK						836	31	33
HOUSE SPARROW		523	200	757	543	21842	76	76
INDIVIDUALS IN TABLES 4 & 5		130	1	15	15			
SPECIES IN TABLES 4 & 5		4	3	4	4			
TOTAL INDIVIDUALS		1402	407	1646	1898			
TOTAL SPECIES ON COUNT DAY		30	13	25	18			
TOTAL SPECIES COUNT PERIOD		31	20	27	18			

Table 4. SPECIES SEEN ON SEVEN OR FEWER COUNTS

SPECIES	LOCATION and NUMBER
PIED-BILLED GREBE	Fort Qu'appelle (1)
WESTERN GREBE	Coronach (1)
AMERICAN WHITE PELICAN	Fort Qu'appelle (1)
TUNDRA SWAN	Qu'appelle Valley Dam (24), Round Lake (2)
WOOD DUCK	Round Lake (2)
GREEN-WINGED TEAL	Fort Walsh (1), Gardiner Dam (1), Yorkton (1)
AMERICAN BLACK DUCK	Coronach (2)
NORTHERN PINTAIL	Fort Qu'appelle (1), Fort Walsh (1)
AMERICAN WIGEON	Coronach (1), Fort Qu'appelle (1), Yorkton (1)
REDHEAD	Coronach (2), Estevan (1), Fife Lake (1), Fort Qu'appelle (1), Gardiner Dam (2), Qu'appelle Valley Dam (1)
LESSER SCAUP	Estevan (5), Gardiner Dam (2)
BUFFLEHEAD	Coronach (17), Estevan (1), Fort Qu'appelle (2)
HOODED MERGANSER	Fort Qu'appelle (+), Squaw Rapids (1)
RED-BREASTED MERGANSER	Yorkton (1)
COMMON MERGANSER	Estevan (1), Gardiner Dam (157), Grayson (1), Saskatoon (2), Squaw Rapids (5)
NORTHERN HARRIER	Indian Head (1)
SHARP-SHINNED HAWK	Cypress Hills P.p. (+)
COOPER'S HAWK	Craven (1), White Bear (+)
ROUGH-LEGGED HAWK	Crooked Lake (1), Estuary (1), Fort Walsh (1), Govenlock (1), Last Mountain Lake N.w.a. (1)
AMERICAN KESTREL	Indian Head (1), Saskatoon (1)
GYRFALCON	Cold Lake - Pierceland (1), Gardiner Dam (1)
PRAIRIE FALCON	Govenlock (1), Grasslands N.p. (1), Harris (1), Leader South (1), Rockglen (1), White Bear (+)
SPRUCE GROUSE	Beauval (1), Love - Torch River (5), Nipawin (+), Squaw Rapids (2), Turtle Lake (2)
WILLOW PTARMIGAN	Love - Torch River (2)
SAGE GROUSE	Govenlock (21)
WILD TURKEY	Estuary (6), Fort Walsh (8), Macdowall (2), Whitewood (+)
AMERICAN COOT	Coronach (34), Estevan (27), Fife Lake (7)
KILLDEER	Saskatchewan Landing P.p. (2)
COMMON SNIPE	Fort Walsh (1)
RING-BILLED GULL	Gardiner Dam (2)
HERRING GULL	Gardiner Dam (4)
MOURNING DOVE	Armit (1), Fort Walsh (+), Leader North (+), Preeceville (1)
BARRED OWL	Armit (1)
GREAT GRAY OWL	Armit (1), Beauval (1), Horseshoe Bend (1), Mayview (2), Prince Albert (+), Turtle Lake (2)
LONG-EARED OWL	Saskatchewan Landing P.p. (1)
BOREAL OWL	Snowden (+)
BELTED KINGFISHER	Crooked Lake (1)
THREE-TOED WOODPECKER	Armit (2), Candle Lake (2), Duck Lake (2), Love - Torch River (+), Prince Albert N.p. (2), Squaw Rapids (3)
NORTHERN FLICKER (R-s)	Leader North (+)
AMERICAN CROW	Moose Mountain (1), Pike Lake (1), Regina (5), Saskatoon (13), Weldon-2 (1)
MOUNTAIN CHICKADEE	Cypress Hills P.p. (1)
BROWN CREEPER	Biggar (1), Indian Head (1), Regina (4), Saskatoon (2), Weyburn (+)
EASTERN BLUEBIRD	Craven (+)
MOUNTAIN BLUEBIRD	Craven (+)
TOWNSEND'S SOLITAIRE	Fort Qu'appelle (+), Fort Walsh (1), Luseland (1), Regina (+)
VARIED THRUSH	Archerwill (+), Saskatoon (+), Waldheim (1)
CEDAR WAXWING	Craven (2), Kinistino (4), pike Lake (6), Regina (15), Saskatoon (35), Yorkton (12)
NORTHERN CARDINAL	Fort Qu'appelle (1)

Table 4. SPECIES SEEN ON SEVEN OR FEWER COUNTS

SPECIES	LOCATION and NUMBER
AMERICAN TREE SPARROW	Eastend (1), Fort Walsh (10), Leader South (4), Pike Lake (1), Skull Creek (21)
VESPER SPARROW	Govenlock (1)
FOX SPARROW	Moose Jaw (1)
SONG SPARROW	Indian Head (1), Luseland (1)
WHITE-CROWNED SPARROW	Fort Qu'appelle (+)
HARRIS' SPARROW	Fort Walsh (1), Kamsack (1), Kenaston (1), Leader South (1), Regina (1), Skull Creek (1), White Bear (1)
DARK-EYED JUNCO (ORE)	Regina (3)
LAPLAND LONGSPUR	Bromhead (1298), Fife Lake (120), Rockglen (5), Weyburn (127), Whitewood (5)
RED-WINGED BLACKBIRD	Fort Wash (6)
WESTERN MEADOWLARK	Kutawagan Lake (1), Rockglen (+)
RUSTY BLACKBIRD	Biggar (1), Bradview (3), Clark's Crossing (1), Regina (+), Skull Creek (1), Whitewood (7)
BREWER'S BLACKBIRD	Archerwill (1), Endeavour (1), Pike Lake (2)
COMMON GRACKLE	Bangor (+), Kamsack (1), Regina (15), Saskatoon (3), Swift Current (1), Weyburn (1)
GRAY-CROWNED ROSY FINCH	Fort Walsh (19), Rockglen (+)
PURPLE FINCH	Fort Qu'appelle (+), Kenosee Lake (10), Regina (1), Swift Current (36), Tisdale (7), Weyburn (2)
WHITE-WINGED CROSSBILL	Cold Lake - Pierceland (18), Raymore (+), Saskatoon (25)
AMERICAN GOLDFINCH	Craven (2), Kenosee Lake (9), Moose Mountain (3), Regina (1), Saskatoon (1), Whitewood (3)

Table 5. BIRDS NOT IDENTIFIED TO SPECIES

SPECIES	LOCATION and NUMBER
DARK GOOSE species	Gardiner Dam (74)
BUTEO species	Cypress Hills P.p. (1)
EAGLE species	Gardiner Dam (2), Saskatoon (1)
HAWK species	Estuary (1)
WOODPECKER species	Fort Walsh (1)
BLACKBIRD species	Saskatchewan Landing P.p. (+)
REDPOLL species	Fort Walsh (17), Saskatchewan Landing P.p. (250)

Table 6: NEW AND TYING 1998 HIGH COUNTS (new highs in bold italic)

LOCATION	1998 COUNT	SPECIES	PREVIOUS HIGH	LOCATION (YEAR)
Coronach	1	WESTERN GREBE	1	N. to Gardiner Dam
<i>Qu'appelle Dam</i>	<i>24</i>	<i>TUNDRA SWAN</i>	<i>8</i>	<i>Regina (1965)</i>
<i>Round Lake</i>	<i>2</i>	<i>WOOD DUCK</i>	<i>1</i>	<i>Gardiner Dam (1988)</i>
Coronach	2	AMERICAN BLACK DUCK	2	Regina (1992, 93, 94)
<i>Coronach</i>	<i>17</i>	<i>BUFFLEHEAD</i>	<i>7</i>	<i>Coronach (1997)</i>
Craven	1	COOPER'S HAWK	1	N. to Kamsack
Indian Head, Saskatoon	1	AMERICAN KESTREL	1	N. to Dalmeny
<i>Snowden</i>	<i>24</i>	<i>RUFFED GROUSE</i>	<i>20</i>	<i>Armit & Kamsack (1997)</i>
<i>Sk. Landing P.P.</i>	<i>2</i>	<i>KILLDEER</i>	<i>1</i>	<i>Govenlock (1982, 90)</i>
<i>Pike Lake</i>	<i>39</i>	<i>HAIRY WOODPECKER</i>	<i>36</i>	<i>Saskatoon (1991)</i>
Saskatoon	111	BLUE JAY	111	Saskatoon (1995)
<i>Saskatoon</i>	<i>976</i>	<i>BLACK-BILLED MAGPIE</i>	<i>670</i>	<i>Saskatoon (1995)</i>
<i>Saskatoon</i>	<i>640</i>	<i>BLACK-CAPPED CHICKADEE</i>	<i>461</i>	<i>Saskatoon (1995)</i>
<i>Craven (count period)</i>	<i>0</i>	<i>EASTERN BLUEBIRD</i>	<i>New</i>	
Waldheim	1	VARIED THRUSH	1	North to Saskatoon
Moose Jaw	1	FOX SPARROW	1	North to Saskatoon
<i>Regina</i>	<i>15</i>	<i>COMMON GRACKLE</i>	<i>11</i>	<i>Regina (1991)</i>
<i>Swift Current</i>	<i>36</i>	<i>PURPLE FINCH</i>	<i>19</i>	<i>Swift Current (1997)</i>
<i>Regina</i>	<i>190</i>	<i>HOUSE FINCH</i>	<i>78</i>	<i>Regina (1996)</i>
<i>Kenosee Lake</i>	<i>9</i>	<i>AMERICAN GOLDFINCH</i>	<i>2</i>	<i>Craven (1995)</i>

Table 7: POPULATION STATUS OF SELECTED SPECIES (based on birds per hours effort)

SPECIES	1998vs1997	1998 vs 1988-97	1994-1998 vs 1989-1993	SPECIES	1998vs1997	1998 vs 1988-97	1994-1998 vs 1989-1993
CANADA GOOSE	-94	-58	896	COMMON RAVEN	10	42	23
MALLARD	-29	40	119	BLACK-CAPPED CHICKADEE	18	29	27
COMMON GOLDENEYE	-33	-21	2	BOREAL CHICKADEE	-15	20	38
BALD EAGLE	-65	-26	98	RED-BREASTED NUTHATCH	-69	-30	153
NORTHERN GOSHAWK	53	-31	-46	WHITE-BREASTED NUTHATCH	5	14	22
GOLDEN EAGLE	-23	-35	-20	BROWN CREEPER	-6	28	53
MERLIN	-22	15	46	GOLDEN-CROWNED KINGLET	-66	-21	39
PRAIRIE FALCON	32	-27	-55	AMERICAN ROBIN	-38	-68	40
GRAY PARTRIDGE	115	-32	-7	BOHEMIAN WAXWING	46	119	28
RING-NECKED PHEASANT	201	-0	-36	CEDAR WAXWING	-84	-86	40
SPRUCE GROUSE	958	7	51	NORTHERN SHRIKE	21	-38	-31
RUFFED GROUSE	-19	12	32	EUROPEAN STARLING	5	-15	118
SHARP-TAILED GROUSE	1	-18	-10	AMERICAN TREE SPARROW	118	13	-43
ROCK DOVE	-20	-15	3	DARK-EYED JUNCO	0	-2	71
GREAT HORNED OWL	-30	-26	-7	LAPLAND LONGSPUR	5777	-29	-41
SNOWY OWL	-58	-41	6	SNOW BUNTING	447	18	-20
SHORT-EARED OWL	394	-11	-40	RUSTY BLACKBIRD	129	-63	-29
DOWNY WOODPECKER	31	19	4	PINE GROSBEAK	-23	-27	37
HAIRY WOODPECKER	28	17	11	HOUSE FINCH	198	519	2845
THREE-TOED WOODPECKER	-23	-7	57	RED CROSSBILL	-4	143	262
NORTHERN FLICKER	-44	9	119	WHITE-WINGED CROSSBILL	-63	-87	68
PILEATED WOODPECKER	26	-13	-22	COMMON REDPOLL	37	-11	-23
HORNED LARK	1171	41	-52	HOARY REDPOLL	104	-36	-70
GRAY JAY	7	-2	2	PINE SISKIN	-10	188	138
BLUE JAY	7	32	28	EVENING GROSBEAK	-64	-59	-19
BLACK-BILLED MAGPIE	11	33	26	HOUSE SPARROW	3	11	-1

TURKEY VULTURE NESTS IN ABANDONED BUILDINGS IN SW MANITOBA

DEAN J. BEREZANSKI, Manitoba Natural Resources, Box 24, 200 Saulteaux Crescent, Winnipeg, MB R3J 3W3

Introduction

Turkey Vultures are summer breeding residents in Manitoba^{6,8} and found as the subspecies *Cathartes aura meridionalis* Swann 1921.¹⁸ Their range within this province is from the boreal forests of Nopiming and Whiteshell parks in the east, to the mixed woods of the Spruce Woods, Turtle Mountain, Riding Mountain, and Duck Mountain parks in the west. To date, only a few records have been kept to follow their breeding population and distribution in Manitoba.^{1,19,21,28,30}

In southwest Manitoba, the species is considered uncommon.⁸ Early accounts from the late 1800s described the species as summer residents near Carberry, and they were also seen in the Shell River area.²⁶ While no evidence was found, they were probably breeding. The species was known to breed, however, in the nearby Qu'Appelle region of Saskatchewan.²⁶ One observer mentioned in 1971 that the species was down in numbers in the Northern Great Plains from the 1930s.¹⁴

The Turkey Vulture declined in population in North America after the 1800s, at the same time as the demise of the bison.^{16,22} The species subsequently began to slowly increase its range throughout the continent, with a noticeable acceleration between 1920 and 1950 in the northeastern U.S. The most plausible reasons offered for this latter expansion were a warming



Nestling Turkey Vulture in farm attic
Dean Berezanski

climate, greater availability of roadkills, and loss of preferred habitat in the southern U.S.²⁹ Another acceleration was seen in the 1980s.^{10,17,23} A regional reduction in pesticide levels, more favourable climate, reduced human persecution, and increased food supply have been given as possible reasons for this latest expansion.^{7,18,23}

Isolation from human disturbance appears to be the most important requirement for Turkey Vulture nests.¹⁸ As for specific habitat, the birds are reportedly more numerous in lowland areas, perhaps because of an abundance of thicket and hollow tree breeding sites.¹⁶ The preferred breeding habitat in North America east of 100°W

includes mixed farmland and forest.^{15,18} Nests are usually on covered sites on the ground.^{2,12} In Canada, specific sites are typically holes in logs, cliffs, caves, and depressions on the ground.^{1,4,12,13,24,25,26,28} A small proportion of their nest sites have been found in abandoned buildings in Canada and in the United States.^{2,24,27,3,16} Extensive use of abandoned structures was, however, reported in southeast Illinois in a study between 1978 to 1983.⁵ Nesting sites are often used several years in a row. This paper compiles several contemporary accounts of their nests, both documented and suspected, in abandoned buildings in southwest Manitoba. Reasons for use of these sites and implications on their status in this province are discussed.

Documented Nesting Sites

Spruce Woods Provincial Park (SWPP) has at least two documented cases of Turkey Vultures nesting within the attics of abandoned houses (Figure 1). The Park (270 sq. km. in size) contains numerous farm buildings which were abandoned when the lands were purchased for Park establishment in the late 1960s. The first site became known to the author in mid-August 1988, when park staff observed a pair of immature Turkey Vultures roosting upon the roof of an abandoned farm house in the Assiniboine River valley during mid-morning (T. Blair pers. comm). Return trips in mornings over the next few weeks found these two juveniles roosting on the roof. Within the main

Figure 1 - Spruce Woods Provincial Park



floor of the house, no apparent signs of nesting were observed and no access to the attic was seen. In June 1989, a return to the same building led to the discovery of a second chimney opening in the roof to the attic. In the attic, amid debris and a putrid smell, was a single, nestling Turkey Vulture. When the attic was entered, the nestling gave a deep, warning hiss and a threat display by spreading its wings. No nesting material was obvious. The site was not inspected in subsequent years.

On 19 August, 1994, another abandoned house was inspected along the Assiniboine River within SWPP. A 'nest' (unlined scrape among debris on the floor) was found in the walking attic space of the house, with two young Turkey Vultures near fledgling age. They had only a few vestiges of down feathers remaining on their backs. One crawled out of an open window and onto the roof but did not fly. The site was not inspected in subsequent years (K. De Smet pers. comm.)

Documentation of another Turkey Vulture nest was located on 21 June, 1991 on Crown land in the Assiniboine River valley near Virden. This nest, as with the first two, was in an abandoned house in a back room on the second story. It contained two nestlings and, besides the presence of feces, no other material was present to suggest a nest structure. Entry by the adults was through an open window. Hissing and threat displays were also elicited from the vultures. The site was not inspected in subsequent years¹¹ (P. Ewashko pers. comm.).

Suspected Nesting sites

Turkey Vultures were seen repeatedly roosting on the roofs of least two other abandoned farm houses in the SWPP area. The locations were probably also

used for nesting although Turkey Vultures do use old buildings solely as roosting sites.¹⁸ One site was also reported in 1995 in the Assiniboine River valley within SWPP (D. Morton pers. comm.), but is no longer standing. Vultures had been seen at this location for as many as ten years prior to the report (B. Gillespie pers. comm.). Another location identified in mid-summer 1989 was south of Sidney (R. Hildebrand pers. comm.) on private land, but was not inspected in subsequent years.

Elsewhere in southwest Manitoba, an individual Turkey Vulture was seen soaring quite low near an abandoned house along the Assiniboine River on 2 May, 1990 near Virden (K. De Smet pers. comm.). A scrape was found among debris on the floor of an upstairs bedroom, but no eggs were in the scrape. This site was not checked again later. On 18 May, 1995, a pair of vultures was seen entering and leaving an old house near Broomhill. They were suspected to be inspecting it for nesting, but no nest or adults were present when the house was checked two weeks later (K. De Smet pers. comm.). Similarly, vultures have been seen exiting second-floor windows of three abandoned buildings west and southwest of Minnedosa in mid-summer (C. Cuthbert pers. comm.).

Discussion

Based on these preceding accounts, expansion of the breeding population of Turkey Vultures has almost certainly occurred in southwest Manitoba since the turn of the century. In addition, the relatively recent accounts from Saskatchewan of nesting in old buildings and the Manitoba nests suggest that Turkey Vultures may be expanding their range into prairie habitat by using abandoned buildings for nesting

habitats.^{2,27} Alternatively, the use of old buildings may be the result of a cumulative loss of traditional habitat, including undisturbed river valleys.

These documented cases of nests in abandoned buildings all have been within river valleys, with considerable relief in the landscape. The surrounding locales had a combination of agricultural fields in secondary succession and riparian and upland mixed wood stands. In addition, all three sites were on, or encircled by, designated Crown lands. Likewise, all of the suspected nest sites, except for the Broomhill one, were in locations with the same characteristics. One reason for an increase in finding these locations is probably due to the fact that Manitoba Natural Resources staff visit such sites frequently, as many are on designated lands.

Vultures may be using these lowland sites as one basis of range expansion, if natural sites were not available. Little data exists to correlate Turkey Vulture population declines with loss of habitat in southwaest Manitoba over the last century. The historic loss of river bottom habitats in southwest Manitoba to agriculture is, however, well-known.²⁰ The Manitoba-documented nest sites were found near rivers and on designated Crown lands, which often have the only intact habitats and buildings remaining.

The Turkey Vulture is already at the northern limits of its range in Manitoba. The Manitoba Conservation Data Centre lists the species as "S4B" - apparently secure and breeding, but of long-term concern in the province, as no definitive population monitoring or studies have been done on vultures in Manitoba.⁹ If range extension, natural habitat loss, or both have occurred, then abandoned buildings may need to be considered as critical habitat in Manitoba for the species.

Additional information on the vulture population and distribution is required to determine the status of the species in Manitoba. Such information is best collected through nest record cards submitted by amateur and professional vulture-watchers to the Prairie Nest Record Scheme at the Manitoba Museum in Winnipeg.

Acknowledgements

My thanks to: K. De Smet (DNR, Melita) for sharing observations, thoughts, and reviewing this article; R. Nero and M. Mossman for their help in identifying references; DNR staff (Carberry, Brandon, and Winnipeg) and D. Morton for their help in reporting sites; the Manitoba Museum for access to their Prairie Nest Record Scheme.

References Cited

1. ANDRUSIAK, E.W., D.C. HARBOTTLE, AND K.R. WHALEY. 1971. First recorded Turkey Vulture nest in Riding Mountain National Park, Manitoba. *Blue Jay* 29:201-202.
2. BEAULIEU, R. 1985. Abandoned house nest site for Turkey Vulture. *Blue Jay* 43:46- 48.
3. BENT, A.C. 1961. The life histories of North American birds of prey. Pt. 1. Dover, New York, N.Y. 409pp.
4. BJORKLUND, C.F. 1989. Turkey Vultures in the Big Muddy. *Blue Jay* 48:103.
5. BUHNERKEMPE, J.E. AND R.L. WESTEMEIER. 1984. Nest-sites of Turkey Vultures in buildings in southeastern Illinois. *Wilson Bull.* 96:495-496.

6. CLEVELAND, N.J., S. EDIE, G.D. GRIEF, G.E. HOLLAND, R.F. KOES, J.W. MAYNARD, W.P. NEILY, P. TAYLOR, AND R. TKACHUK. 1988. Birder's guide to southeastern Manitoba. EcoSeries No. 1. Man. Naturalists Soc., Winnipeg. 91 pp.
7. COLEMAN, J.S. AND J.D FRASER. 1989. *In* Sauer, J.R., J.E. Hines, G. Gough, I. Thomas, and B.G. Peterjohn. 1997. The North American breeding bird survey results and analysis. Ver. 96.3. Rev. 18 April 1997. Patuxent Wildlife Research Centre, Laurel, MD. <http://www.mbr-pwrc.usgs.gov/bbs/> June 10, 1998 ver.
8. CUTHBERT, C.W., J.I. HORTON, M.W. MCCOWAN, B.G. ROBINSON, AND N.G. SHORT. 1990. Birder's guide to southwestern Manitoba. Published by the authors in cooperation with the Brandon Natural History Soc. 100pp.
9. DUNCAN, J. R. 1996. Conservation status ranks of the birds of Manitoba. Man. Conservation Data Centre MS Rep. 96-06. 26pp.
10. ENVIRONMENT CANADA 1996. Canadian bird trends data base. Turkey Vulture. Can. Wildlife Serv. Jan. 13, 1997 Update. <http://www1.ec.ca/cgi-bin/foiocgi.exe/canbird.nfo/query+/doc/{t826}> June 10, 1998 ver.
11. EWASHKO, P. Man. Natural Resources Tech. Memo to D. Chranowski, Man. Natural Resources, Brandon. August 6, 1991.
12. GODFREY, W.E. 1986. The birds of Canada, revised edition. National Museums of Can., Ottawa. 595pp.
13. HOUSTON, C.S. 1969. Turkey Vulture breeding records in Saskatchewan. Blue Jay 27:37-39.
14. HOUSTON, C.S. 1971. Northern Great Plains Region. Am. Birds 25:869-872.
15. JACKSON, J.A. 1983. Nesting phenology, nest site selection, and reproductive success of Black and Turkey Vultures. *In* Wilbur, J.R. and J.A. Jackson (eds.) Vulture biology and management. U. Calif. Press, Berkeley. pp. 245-270.
16. JACKSON, J.A. 1988. Turkey Vulture *Cathartes aura* *In*: Palmer, R.S. Handbook of North American Birds. Vol. 4. Yale U. Press, New Haven. pp 25-42.
17. KIRK, D.A. AND C. HYSLOP. 1998. Population trends in Canadian raptors: a review. Biol. Cons. 83:91-118.
18. KIRK, D.A. AND M.J. MOSSMAN. 1998. Turkey Vulture (*Cathartes aura*). *In* The birds of North America, No. 339 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
19. LLOYD, H. 1922. Some northern records of the Turkey Vulture. Can. Field-Nat. 36:178-179.
20. MARR CONSULTING & COMMUNICATIONS LTD. AND SYNTHEN RESOURCE SERVICES. 1995. Riverbottom forest assessment: forest ecosystem classification and management recommendations. Final rep. to Can. Forestry Serv. and Man. Forestry Branch. 20pp. + app.
21. PRAIRIE NEST RECORDS SCHEME. Higher Vertebrates Section, Man. Museum, Winnipeg. June 1998.
22. RAINE, W. 1892. Bird-nesting in North-west Canada. Hunter, Rose, Toronto

23. SAUER, J.R., J.E. HINES, G. GOUGH, I. THOMAS, AND B.G. PETERJOHN. 1997. The North American breeding bird survey results and analysis. Ver. 96.3. Rev.18 April 1997. Patuxent Wildlife Research Centre, Laurel, MD. <http://www.mbr-pwrc.usgs.gov/bbs/> June 10, 1998 ver.
24. SMITH, A.R. 1996. Atlas of Saskatchewan birds. Spec. Publ. No. 22. Sask. Natural History Soc., Regina.
25. TAVERNER, P.A. 1974. Birds of eastern Canada. Coles Publ. Co. Ltd., Toronto. 290pp.
26. THOMPSON, E.E. 1891. The birds of Manitoba. Proc. U.S. National Museum 13:475-643. 2nd ed. reprinted by Premium Ventures Ltd., Winnipeg.
27. WAPPLE, G.J. 1985. Nesting Turkey Vulture near Biggar, Saskatchewan. Blue Jay 43:44-46.
28. WHALEY, K.R. 1973. Vultures of Riding Mountain. Man. Nature 14:4-9.
29. WILBUR, S.R. 1983. The status of vultures in the Western Hemisphere. In Wilbur, J.R. and J.A. Jackson (eds.) Vulture biology and management. U. Calif. Press, Berkeley. pp. 113-123.
30. WRIGHT, J.F. 1924. Breeding of the Turkey Vulture in eastern Manitoba. Can. Field-Nat. 38:76.



Turkey Vulture

R.T. Long

MAMMALS

SASKATCHEWAN CHRISTMAS MAMMAL COUNT - 1998

Compiled by Wayne C. Harris, Saskatchewan Environment and Resource Management, 350 Cheadle Street West, Swift Current, SK S9H 4G3

The number of mammal counts conducted this year was 87. Although fewer than last years record, it is still the second highest number ever. The number of species recorded was 39, the same as last year. The average number of species per count (7.2), which is higher than last year but still below the long-term average.

Weather was warmer than usual up to the count period and then normal temperatures prevailed. The lack of snow for most localities during the count meant that animals remained dispersed and tracks were hard to find; only those counts conducted later in the count period had good tracking snow. No new species were reported. The only species found this year which are irregularly reported were Woodland Caribou and Mountain Lion. Ironically the Woodland Caribou was at Candle Lake, the same count that last reported this species in the 1970's.

Mountain Lion tracks were found Robert Wapple and Wayne Renaud in Coal Mine Coulee on the Herschal count. Robert writes that " Fresh snow the previous night resulted in very distinct tracks. The tracks went in both directions, indicating that the lion had travelled along the creek and returned via the same route. Individual paw prints were estimated to be the size of my fist (we had no rule). Distinct claw marks were evident on some of the tracks

imprinted in the skiffs of fresh snow on the wind-polished creek ice, indicating that the lion needed some extra traction on the slippery ice. Unfortunately, we didn't try to distinguish between front and back paws. I tried to approximate the distances between print sets and found that stride distance was approximately one normal pace, which would be .5 to .75 m. No tail marks were observed in the snow between the tracks."

White-tailed Deer were the most frequently encountered species with 84% of counts recording them. Coyotes were next at 78% followed by Red Fox (54%) and Snowshoe Hare (53%). White-tailed Jackrabbit (44%) were less frequent than usual but this may be an artifact of poor tracking conditions.

For weather, coverage and participants please refer to the Christmas Bird Count found elsewhere in this issue. In the tables, a numeral alone shows that the mammals were seen, while a letter following the number means that the number was inferred by the means defined below. A letter alone means that the species was present but estimating the numbers was impossible or that no attempt was made to do so.

Symbols used in the tables are:

T = tracks

L = active lodge or hut

D = dead animal found

d = fresh diggings found

S = smell or odour

H = heard

+ = present during the count period
(December 18 to January 3) but not
found on count day.

The tables are started on following page.



Elk

Peter Suzle

Table 1-1: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCALITY and DATE	ARCHERWILL December 29, 1998	ARMIT January 02, 1999	BANGOR December 31, 1998	BIGGAR December 27, 1998	BIRCH HILLS December 22, 1998	BRIGHTWATER RES. December 21, 1998	BROADVIEW December 26, 1998	BROMHEAD December 31, 1998	CANDLE LAKE December 30, 1998
MASKED SHREW										
SHREW species								2T		
EASTERN COTTONTAIL										
NUTTALL'S COTTONTAIL										
SNOWSHOE HARE			25T	2	6T	1+28T		28T		40T
WHITE-TAILED JACKRABBIT		2			3T				T	
GREY SQUIRREL		4								
FOX SQUIRREL								1		
RED SQUIRREL			6	1		2		4+4T		16T
NORTHERN FLYING SQUIRREL										
BEAVER			2L							
DEER MOUSE								4T		
GAPPER'S RED-BACKED VOLE										
MUSKRAT			2L		5L					
MEADOW VOLE										
VOLE species						3T				2T
MOUSE species			10T		8T	7T				3T
NORWAY RAT									1S	
HOUSE MOUSE		T		2T						
PORCUPINE		2		2T						1T
COYOTE		2+4T	1+1D	5H	2+10T	2+6T	4	3T	1	3T
WOLF		1	13T							
RED FOX		1		1	1			1T	2	1+1T
SWIFT FOX										
BLACK BEAR										
RACCOON										
FISHER			1T							1T
ERMINE						2T		1T		
LONG-TAILED WEASEL								3T		2T
LEAST WEASEL				1T						
WEASEL species		1+1T	1T							
MINK			1T			2T		1T		1T
BADGER										
STRIPED SKUNK										
RIVER OTTER										1T
MOUNTAIN LION										
WOODLAND CARIBOU										3T
MULE DEER					38		2	2		
WHITE-TAILED DEER		2+7T	6	5	21			12+19T	51	5+39T
DEER species			10T							
MOOSE		5T	1T							4T
ELK		5T	10T							8T
PRONGHORN										
TOTAL SPECIES		11	14	8	8	7	2	12	5	15

Table 1-2: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

CLARK'S CROSSING December 19, 1998	COCHIN December 27, 1998	COLD L.-PIERCEL. December 26, 1998	CORONACH December 23, 1998	CRAVEN December 19, 1998	CROOKED LAKE December 21, 1998	CROOKED RIVER December 28, 1998	CYPRESS HILLS P.P. December 30, 1998	DUCK LAKE December 29, 1998	LOCALITY and DATE SPECIES
									MASKED SHREW
									SHREW species
					T				EASTERN COTTONTAIL
									NUTTALL'S COTTONTAIL
1+15T	30T			2T	T	2			SNOWSHOE HARE
1+2T	2T		2T	T					WHITE-TAILED JACKRABBIT
				4					GREY SQUIRREL
									FOX SQUIRREL
	1	12		3	5	1		6	RED SQUIRREL
									NORTHERN FLYING SQUIRREL
					2L				BEAVER
									DEER MOUSE
									GAPPER'S RED-BACKED VOLE
									MUSKRAT
									MEADOW VOLE
									VOLE species
1T	3T		2T	T					MOUSE species
									NORWAY RAT
									HOUSE MOUSE
1+1T	1T	1					2		PORCUPINE
4+1T	1+15T		2	5+2T	T				COYOTE
									WOLF
2+1T	3T	1	1T	2T	T				RED FOX
									SWIFT FOX
									BLACK BEAR
									RACCOON
									FISHER
									ERMINE
2T									LONG-TAILED WEASEL
2T									LEAST WEASEL
									WEASEL species
					2				MINK
									BADGER
				2S					STRIPED SKUNK
									RIVER OTTER
									MOUNTAIN LION
									WOODLAND CARIBOU
16	5+10T			9			24		MULE DEER
7+1T	2+50T		5	29	T	T	42	3	WHITE-TAILED DEER
4T				T					DEER species
							1		MOOSE
							150		ELK
									PRONGHORN
10	9	3	5	10	8	3	5	2	TOTAL SPECIES

Table 1-3: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCALITY and DATE	DUVAL December 28, 1998	EASTEND December 29, 1998	EMMA LAKE January 02, 1999	ENDEAVOUR December 22, 1998	ESTEVAN December 24, 1998	ESTUARY January 03, 1999	FENTON December 21, 1998	FORT QU'APPELLE December 18, 1998	FORT WALSH December 19, 1998	GARDINER DAM December 21, 1998
MASKED SHREW											
SHREW species											
EASTERN COTTONTAIL					4+10T						
NUTTALL'S COTTONTAIL		11					2			5T	1+3T
SNOWSHOE HARE		2		T				11T	11		7T
WHITE-TAILED JACKRABBIT		7							1		4T
GREY SQUIRREL											
FOX SQUIRREL						3+2T					
RED SQUIRREL				8	+			3+5T	6	7	
NORTHERN FLYING SQUIRREL					+						
BEAVER		1L								1T	
DEER MOUSE						2T		4T	+	2T	1T
GAPPER'S RED-BACKED VOLE											
MUSKRAT		8L							+		
MEADOW VOLE									1		
VOLE species											
MOUSE species		3T				5T		2T			
NORWAY RAT											
HOUSE MOUSE									1		
PORCUPINE		2T	T		1T	3	2		+	1	6T
COYOTE		14T	1		1T	2T	6	6T	1	1+5T	5+2T
WOLF					+				+		
RED FOX		4T				1T				1T	
SWIFT FOX											
BLACK BEAR											
RACCOON											
FISHER											
ERMINE											
LONG-TAILED WEASEL		2T						1T	+		
LEAST WEASEL								1T		1T	
WEASEL species						1T					
MINK				1					+		
BADGER											
STRIPED SKUNK											
RIVER OTTER											
MOUNTAIN LION											
WOODLAND CARIBOU											
MULE DEER		3	3				4		+	15	116
WHITE-TAILED DEER			7	T	6	20	22	4T	+	56	212
DEER species		42T									
MOOSE					1T						
ELK					1T					1+10T	
PRONGHORN									+	18	
TOTAL SPECIES		11	4	4	8	8	5	7	15	12	8

Table 1-4: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

GOOD SPIRIT LAKE January 03, 1998	GOVENLOCK December 20, 1998	GRASSLANDS N.P. December 21, 1998	GRAYSON December 26, 1998	HARRIS December 23, 1998	HEPBURN December 30, 1998	HERSCHAL December 29, 1998	HOLBEIN December 27, 1998	HORSESHOE BEND January 01, 1998	INDIAN HEAD December 27, 1998	LOCALITY and DATE	SPECIES
											MASKED SHREW
											SHREW species
											EASTERN COTTONTAIL
	2+4T	1T				2T					NUTTALL'S COTTONTAIL
10T				6T					2		SNOWSHOE HARE
8T		4T	1T	1T							WHITE-TAILED JACKRABBIT
											GREY SQUIRREL
											FOX SQUIRREL
4					1			4	11		RED SQUIRREL
											NORTHERN FLYING SQUIRREL
								6T			BEAVER
											DEER MOUSE
											GAPPER'S RED-BACKED VOLE
											MUSKRAT
			2					+			MEADOW VOLE
				8T							VOLE species
						1T	2				MOUSE species
											NORWAY RAT
								1			HOUSE MOUSE
1						1			2		PORCUPINE
9T	2+1T	7+4T	1	2		5+9T		6	7		COYOTE
											WOLF
2T				4T		4T		3	1		RED FOX
	2T										SWIFT FOX
											BLACK BEAR
											RACCOON
											FISHER
											ERMINE
											LONG-TAILED WEASEL
		1T						1			LEAST WEASEL
2T						1T					WEASEL species
											MINK
											BADGER
											STRIPED SKUNK
											RIVER OTTER
						1T					MOUNTAIN LION
											WOODLAND CARIBOU
	76	26		48		4					MULE DEER
76T	18		17	16		11			3		WHITE-TAILED DEER
		32+15T									DEER species
3T						2T					MOOSE
											ELK
	165	234				27					PRONGHORN
9	6	7	4	7	1	11	1	7	6		TOTAL SPECIES

Table 1-5: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCALITY and DATE									
	KAMSACK December 26, 1998	KEL VINGTON December 31, 1998	KENASTON December 21, 1998	KENOSEE LAKE December 20, 1998	KINISTINO December 29, 1998	KINLOCH January 03, 1999	KUTAWAGAN LAKE December 27, 1998	LAST MTN. L. WMA December 26, 1998	LEADER (N) December 26, 1998	LEADER (S) December 26, 1998
MASKED SHREW										
SHREW species										
EASTERN COTTONTAIL				1T						
NUTTALL'S COTTONTAIL			T						2	
SNOWSHOE HARE	T	21T		1T		30T				
WHITE-TAILED JACKRABBIT		3T	5T				2T	4T	2	
GREY SQUIRREL										
FOX SQUIRREL										
RED SQUIRREL				5	1	4				
NORTHERN FLYING SQUIRREL	2									
BEAVER				5L		3L				
DEER MOUSE			T					1T	1	
GAPPER'S RED-BACKED VOLE										
MUSKRAT				1L						
MEADOW VOLE			T							
VOLE species										
MOUSE species		5T			5T				4	
NORWAY RAT		T								
HOUSE MOUSE									1	
PORCUPINE	1			2			1		1	
COYOTE	H	4T	T	1T		6T	1	2T	4	2
WOLF						1T				
RED FOX	2		T	1		1T				1
SWIFT FOX										
BLACK BEAR	1					1L				
RACCOON	3									
FISHER										
ERMINE										
LONG-TAILED WEASEL		2T	1T							
LEAST WEASEL										
WEASEL species						3T				
MINK						1T		1T		
BADGER										
STRIPED SKUNK										
RIVER OTTER										
MOUNTAIN LION										
WOODLAND CARIBOU										
MULE DEER							4		12	26
WHITE-TAILED DEER	86	3+40T	2	38		6	3	22	20	12
DEER species										
MOOSE	8					2T				
ELK	18					15T				
PRONGHORN										
TOTAL SPECIES	10	7	8	9	2	12	5	5	8	4

Table 1-6: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

LIVELONG December 30, 1998	LOVE-TORCH R. December 26, 1998	LUSELAND December 26, 1998	MACDOWALL December 25, 1998	MEADOW LAKE December 27, 1998	MELFORT December 28, 1998	MELVILLE December 26, 1998	MOOSE JAW December 26, 1998	MOOSE MOUNTAIN December 30, 1998	NIPAWIN December 29, 1998	LOCALITY and DATE	SPECIES
			2T								MASKED SHREW
											SHREW species
											EASTERN COTTONTAIL
											NUTTALL'S COTTONTAIL
			4T	25T							SNOWSHOE HARE
1		1	1T				7				WHITE-TAILED JACKRABBIT
											GREY SQUIRREL
							11				FOX SQUIRREL
	4		2	2H				6	1		RED SQUIRREL
											NORTHERN FLYING SQUIRREL
											BEAVER
											DEER MOUSE
											GAPPER'S RED-BACKED VOLE
											MUSKRAT
											MEADOW VOLE
											VOLE species
				12T		1T					MOUSE species
											NORWAY RAT
											HOUSE MOUSE
			1T					1			PORCUPINE
2		2	1+3T	1T	1			3			COYOTE
											WOLF
+			2T			1T		1			RED FOX
											SWIFT FOX
											BLACK BEAR
			1T								RACCOON
											FISHER
											ERMINE
+											LONG-TAILED WEASEL
											LEAST WEASEL
			2T			1T					WEASEL species
											MINK
											BADGER
											STRIPED SKUNK
											RIVER OTTER
											MOUNTAIN LION
											WOODLAND CARIBOU
+		17							7		MULE DEER
5	15	7	20T	8+30T	2	2T	6	18			WHITE-TAILED DEER
											DEER species
		2									MOOSE
											ELK
											PRONGHORN
6	2	5	10	5	2	4	3	5	2		TOTAL SPECIES

Table 1-7: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCALITY and DATE	NISBET FOREST January 01, 1999	PIKE LAKE January 02, 1998	PORCUPINE PLAIN December 28, 1998	PREECEVILLE December 27, 1998	PRINCE ALBERT December 20, 1998	PRINCE ALBERT N.P. December 20, 1998	QU'APPELLE V. DAM December 20, 1998	RAYMORE December 25, 1998	REGINA December 26, 1998	ROCKGLEN January 02, 1999
MASKED SHREW											
SHREW species							1T				
EASTERN COTTONTAIL											
NUTTALL'S COTTONTAIL											3
SNOWSHOE HARE		2	2T		T	11T	1+25T	10T	7	T	+
WHITE-TAILED			2T		T				2	19	+
GREY SQUIRREL											
FOX SQUIRREL										2	
RED SQUIRREL		4	7	1	3	3T	11+23T			11	
NORTHERN FLYING											
BEAVER					L		1L			2T	
DEER MOUSE						1T			2+5T	22T	
GAPPER'S RED-BACKED									1		
MUSKRAT					L						
MEADOW VOLE									1	T	
VOLE species			1T				1T				
MOUSE species			1T			6T					
NORWAY RAT											
HOUSE MOUSE											
PORCUPINE		1	1	2T	T					1T	+
COYOTE		3T	4		T	1+9T		1	2	16T	+
WOLF											
RED FOX		1T	1T			1	3+10T			1	
SWIFT FOX											
BLACK BEAR											
RACCOON											
FISHER					T		1T				
ERMINE							6T				
LONG-TAILED WEASEL						1T					
LEAST WEASEL		2T	1T			1T				2T	+
WEASEL species					T					2T	
MINK										6T	+
BADGER											1
STRIPED SKUNK						1S					
RIVER OTTER											
MOUNTAIN LION											
WOODLAND CARIBOU											
MULE DEER								6		4	11
WHITE-TAILED DEER		20T	18+15	20T	7	8+23T	5	8	1+11T	31	30
DEER species			35T				42T				
MOOSE							4T				
ELK				10T			33+23T				
PRONGHORN											
TOTAL SPECIES		7	10	4	10	10	12	4	7	14	10

Table 1-8: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

ROUND LAKE December 19, 1998	SK. LANDING P.P. December 22, 1998	SK. RIVER FORKS December 23, 1998	SASKATOON December 26, 1998	SHAMROCK December 22, 1998	SKULL CREEK December 26, 1998	SNOWDEN December 30, 1998	SPALDING December 27, 1998	SPRUCE HOME December 27, 1998	SQUAW RAPIDS January 02, 1999	LOCALITY and DATE	SPECIES
	1T										MASKED SHREW
		1T					T		1T		SHREW species
											EASTERN COTTONTAIL
	2+11T										NUTTALL'S COTTONTAIL
12T		8T	4+20T	5T		20T	T		7T		SNOWSHOE HARE
2T	2T	1T	3		1				1T		WHITE-TAILED JACKRABBIT
											GREY SQUIRREL
											FOX SQUIRREL
7		5+4T	1+1T			8			12		RED SQUIRREL
											NORTHERN FLYING SQUIRREL
1L									2L		BEAVER
	2T	5T	3T					1T	2T		DEER MOUSE
											GAPPER'S RED-BACKED VOLE
1									7L		MUSKRAT
12T			1T			3T			8T		MEADOW VOLE
	2T						T				VOLE species
		2T	4+2T			10T	T				MOUSE species
											NORWAY RAT
											HOUSE MOUSE
1	2		2+1T			+			1T		PORCUPINE
4	1+3T	4T	7+6T		6		T		5T		COYOTE
									2+2T		WOLF
10T		1T	1+3T	2T	1		T		1		RED FOX
											SWIFT FOX
											BLACK BEAR
						2T					RACCOON
											FISHER
									2T		TERMINE
		2T				1T					LONG-TAILED WEASEL
					1	+					LEAST WEASEL
	1T		2T						3T		WEASEL species
2	1	1T							1T		MINK
											BADGER
											STRIPED SKUNK
									1T		RIVER OTTER
											MOUNTAIN LION
											WOODLAND CARIBOU
	38				22						MULE DEER
3	52	2+2T	22	8+2T	7		T		5		WHITE-TAILED DEER
			9T								DEER species
									1T		MOOSE
						1			11+5T		ELK
	28										PRONGHORN
11	12	10	10	3	6	9	7	1	18		TOTAL SPECIES

Table 1-9: SASKATCHEWAN CHRISTMAS MAMMAL COUNTS

SPECIES	LOCALITY and DATE	SWIFT CURRENT January 03, 1999	TOGO December 27, 1998	WATSON January 03, 1999	WELDON - 1 January 01, 1998	WELDON - 2 December 28, 1998	WEYBURN December 19, 1998	WHITE BEAR December 27, 1998	WHITEWOOD December 27, 1998	YORKTON December 28, 1998	TOTAL NUMBER OF COUNTS / SPECIES
MASKED SHREW											1
SHREW species											6
EASTERN COTTONTAIL											3
NUTTALL'S COTTONTAIL	1+3T										12
SNOWSHOE HARE	9T				T	T			39T	1+7T	46
WHITE-TAILED JACKRABBIT	2+2T			1T			T	T			38
GREY SQUIRREL	13										3
FOX SQUIRREL							T		2		6
RED SQUIRREL					1	2			5		43
NORTHERN FLYING SQUIRREL											2
BEAVER									3L		12
DEER MOUSE									1L		19
GAPPER'S RED-BACKED VOLE											1
MUSKRAT									29L		9
MEADOW VOLE									2T		11
VOLE species										1	8
MOUSE species				2T		T					26
NORWAY RAT											2
HOUSE MOUSE									3T		6
PORCUPINE								+	1		37
COYOTE	5+1T		T	1	2			17	5	3T	68
WOLF											6
RED FOX	2T		T	2T				1	1	2T	47
SWIFT FOX											1
BLACK BEAR											2
RACCOON									3		4
FISHER											4
ERMINE											4
LONG-TAILED WEASEL											12
LEAST WEASEL											13
WEASEL species									1T		14
MINK											15
BADGER									1d		2
STRIPED SKUNK											2
RIVER OTTER											2
MOUNTAIN LION											1
WOODLAND CARIBOU											1
MULE DEER	40							165			30
WHITE-TAILED DEER	7	3	8T	6			T		16	12+1T	73
DEER species	14T					T					10
MOOSE											12
ELK						T			3T		14
PRONGHORN											6
TOTAL SPECIES	8	3	5	4	5	3	5	16	5		

STUDIES ON A BLOOM-FORMING BLUE-GREEN ALGA, *Anabaena* *flos-aquae* IN THE WASCANA LAKE IN REGINA

H.E. MANN, Biology Department, Sir Wilfred Grenfell College, Memorial
University of Newfoundland, Corner Brook, NF A2H 6P9 and

M.V.S. RAJU, Biology Department, University of Regina, Regina, SK S4S 0A2

Anabaena forms extensive algal blooms in the Wascana Lake of the Qu'Appelle river system in Regina in spring and summer. In late May and June when the lake water begins to warm up, the overwintering cell-type, the akinete, begins to divide in the lake bottom to produce tangled or flexuose masses of filaments (Fig. 1A, B). Air gets trapped between the filaments making the mass buoyant. It migrates to the surface or subsurface regions of the lake in dense masses. Within the individual cells of a filament also gas vacuoles develop which make the flexuose masses buoyant forming an algal bloom.

Algal blooms also called "water blooms" occur throughout the world. Algal bloom formation in lakes is a natural phenomenon in the ecosystem of lakes, especially in shallow saline lakes, of western Canada. In lakes of Saskatchewan many environmental factors, especially total dissolved chemicals, contribute to the formation of algal blooms.⁷ Sewage effluents and farmland and feedlot runoff may increase the phosphorous and nitrates, which stimulate abundant production of algal blooms in lakes. Intense radiation of the sun, common on the prairies, can

help concentrate the available total solid contents of lakes encouraging algal blooms.

Most members that form blooms in lakes are the blue-green algae belonging to the division Prokaryota.^{1,8,9,18} The most common genera in lakes of western Canada are *Anabaena*, *Aphanizomenon* and *Microcystis*.^{5,6,12,13} They are ubiquitously distributed in the saline lakes of the world. These blue-greens, which presumably appeared about 3.5 billion years ago in the Precambrian, still retain very similar morphological features.^{14,15} It is important to recognize that they have survived so long without sexual reproduction, indicating the tenacity and recalcitrant nature of their cell structure and the mode of reproduction.

The algae that are known to form abundant blooms reproduce asexually.^{9,10,17} One of the mechanisms is their reproduction by akinetes and this is especially true of the algae that form blooms in Wascana Lake. The remarkable ability of akinetes to germinate simultaneously may be the fundamental reason for uniform and sudden appearance of algal blooms in lakes.

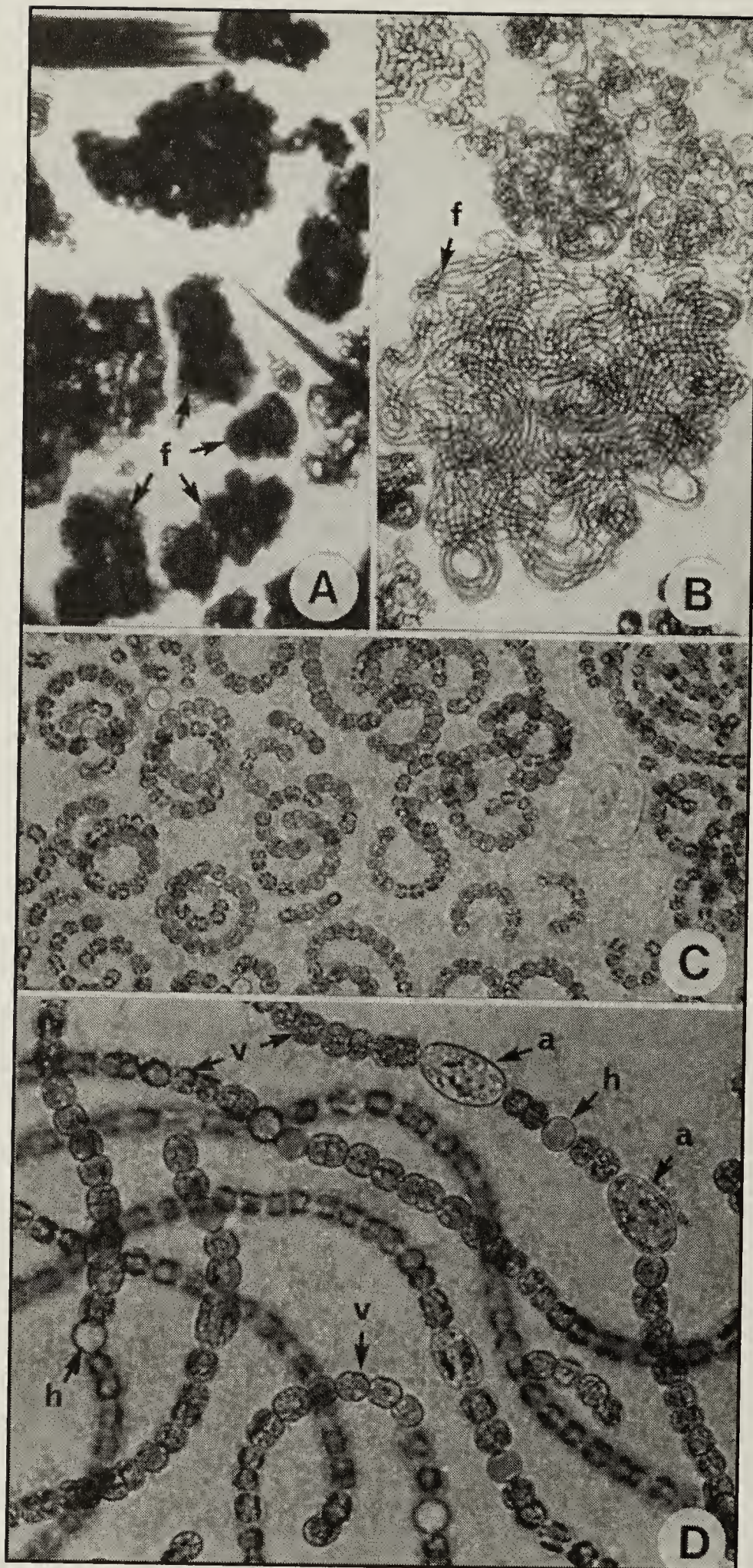


Figure 1. Morphology of filaments of *Anabaena flos-aquae* (Lyngb.) De. Brébisson collected from the Wascana Lake. **A.** Clumps of flexuose (f) filaments in early spring. x 120. **B.** Enlarged view of a flexuose (f) mass to show highly tangled filaments. x 140. **C.** Enlarged view of short filaments of the alga in summer. x 800. **D.** Enlarged view of unbranched filaments containing vegetative or somatic cells (v), akinetes (a) and heterocysts (h). x 1200.

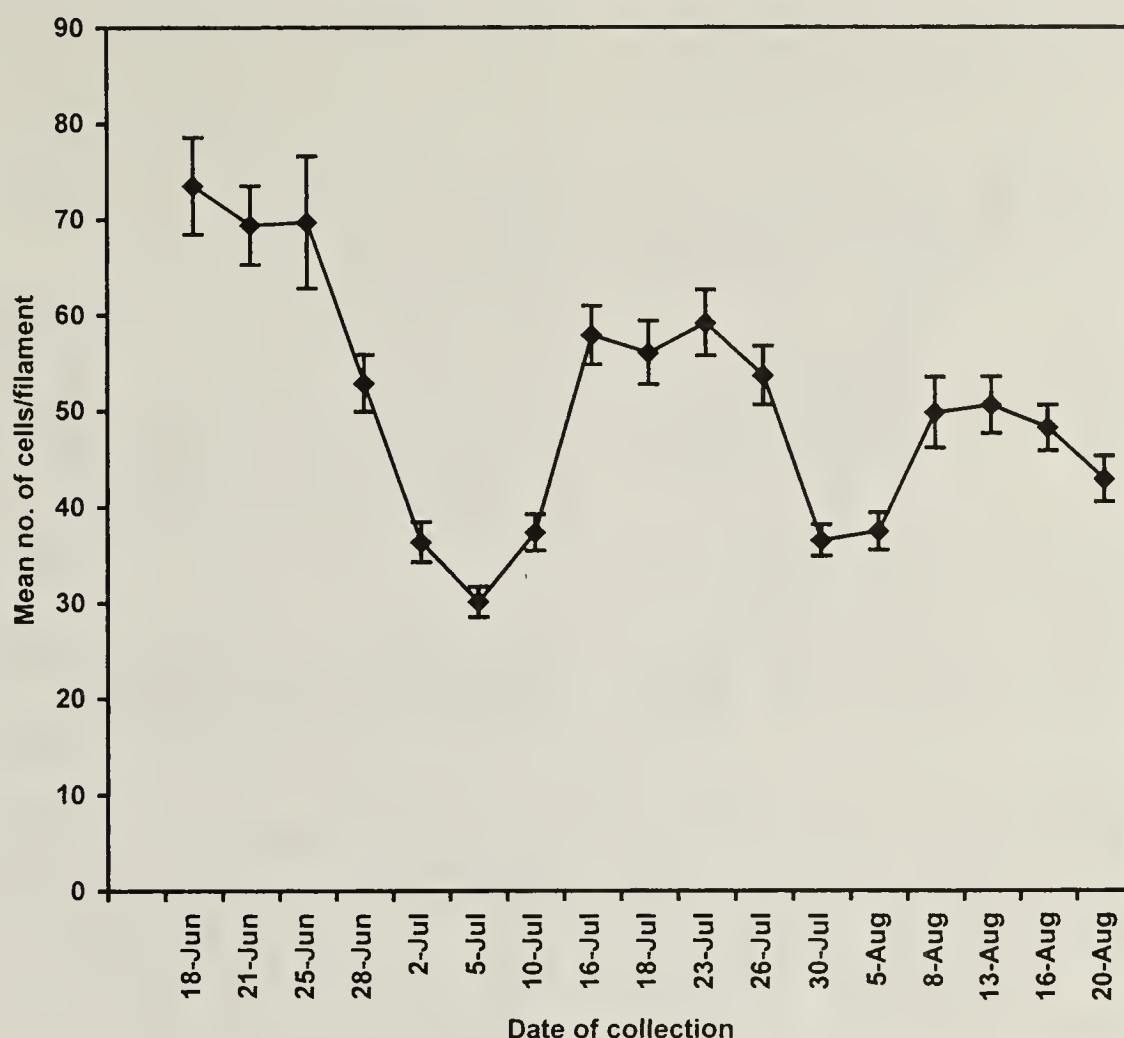


Figure 2. Changes in the number of cells per filament of *Anabaena flos-aquae* during the growing season in the Wascana Lake. (Standard errors are indicated)

Although general observations on algal blooms in Wascana Lake have been made for many years, the data reported here were obtained during the summers of 1974 and 1984.¹⁰⁻¹² During algal bloom at Wascana Lake, the alga *Anabaena* shows many morphological changes which are reported here (Fig. 1). The masses of *Anabaena* contain tangled unbranched filaments. These filaments elongate by cell division and the number of cells per filament peaks early in the growing season and decreases progressively by fragmentation until about the first week of July (Fig. 2). In about mid-July the filaments elongate slightly by cell division and subsequently, the filament length remains about the same until the end of the season (Fig. 2). If the environmental conditions remain stable and without strong winds, the filaments

may continue to elongate. During the latter part of the summer the individual filaments are also short due to fragmentation (Figs. 1C, 2).

The filaments of *Anabaena* contain three distinct cell types that can easily be identified and studied under a compound microscope, the vegetative cells, heterocysts and akinetes (Fig. 1D). The vegetative cells (Fig. 1D) contain photosynthetic pigments and other cell inclusions that aid in cell growth and reproduction. The heterocysts (Fig. D) contain a variety of enzymes that help cell functions, including the unique fixing of elemental nitrogen from the atmosphere to form nitrogen compounds transported to other cells.^{3,16} They also form the sites where the filaments separate to form shorter filaments. The akinete is a

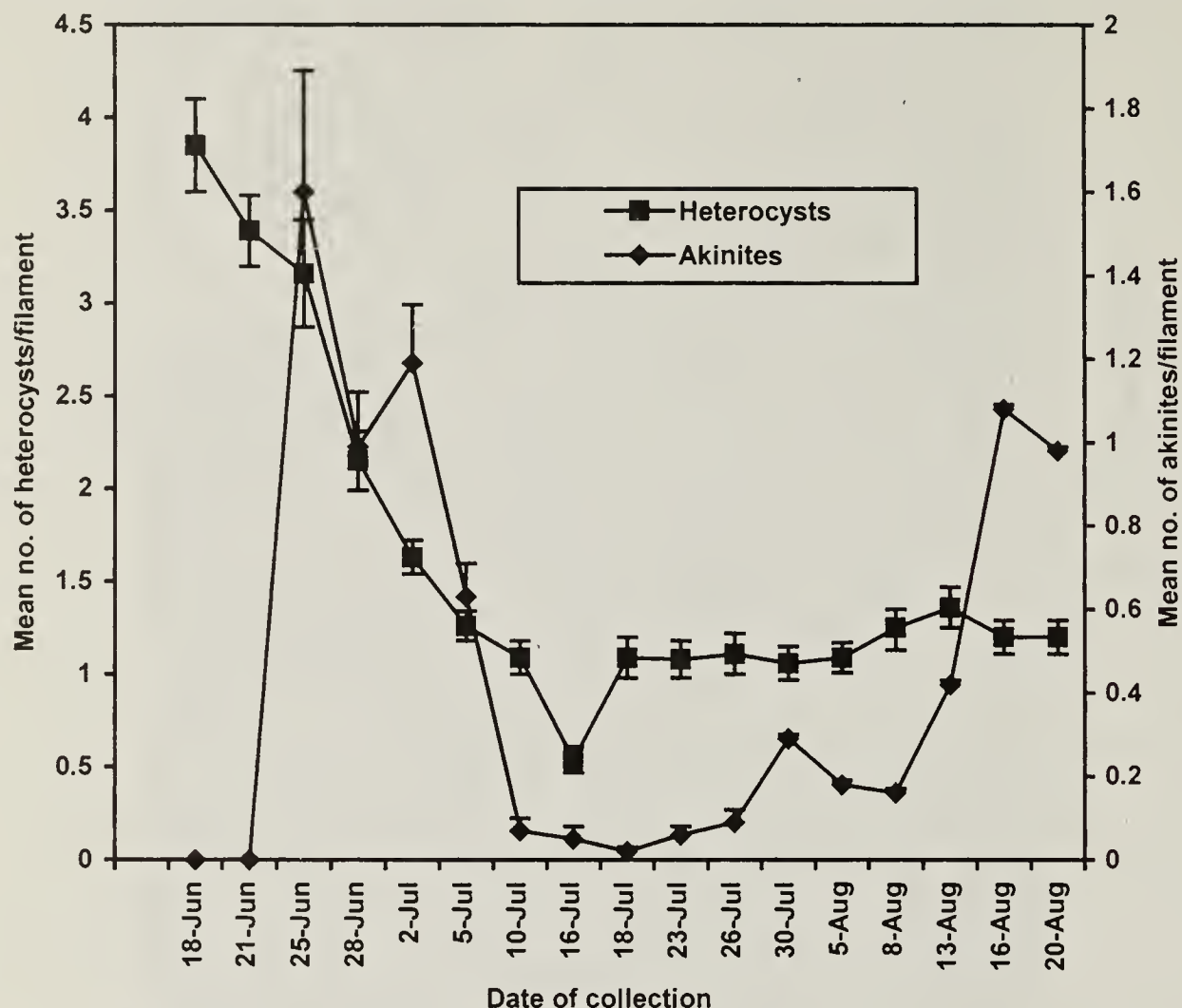


Figure 3. A comparison of changes in the number of cell types in filaments of *Anabaena flos-aquae* in the Wascana Lake during the growing season. (Standard errors are indicated).

repository of abundant storage substances (Fig. 1D). The akinete is important in the asexual reproduction of the species. It can overwinter and germinate in spring to form a filament.

Both heterocysts and akinetes are produced throughout the growing season. Abundant heterocysts are produced early in the season and their number declines considerably by about mid-July (Fig. 3). Subsequently, there is a slight increase and the number stays about the same during the rest of the summer (Fig. 3). The akinete cells do not increase until June (Fig. 3). Eventually, they decline in number and continue to be about the same until the first week of August and later greatly increase (Fig. 3). In the final stages the vegetative cells of filaments disintegrate

freeing akinites which sink to the bottom of the lake.

Wascana Lake, because of its location, is highly visible to residents of Regina. It is also readily accessible to many schools and the University of Regina, offering an opportunity for environmental and biological investigations at all levels. Its waters are teeming with abundant microorganisms, including algae and invertebrates. Rather than considering Wascana Lake a eutrophic "duckpond" it can be a unique educational opportunity waiting at our doorstep to be investigated. Some papers relating to Wascana Lake have been published.¹⁰⁻¹²

In the Fall of 1997 and 1998, the city

of Regina drained off completely a part of Wascana Lake to monitor the after-effects on the flora and fauna there. It would be extremely interesting to see the changes in that part of the lake in the coming years!

References

1. CARR, N.G. and B.A. WHITTON. 1973. The biology of the blue-green algae. University of California Press, Berkeley.
2. _____ and _____. 1983. The biology of cyanobacteria. University of California Press, Berkeley.
3. FOGG, G.E. 1971. Nitrogen fixation in lakes. Plant and Soil. Special Volume 1971. Pp. 393-401.
4. FOGG, G.E., W.D.P. STEWART, P. FAY and A.E. WALSBY. 1973. The Blue-green algae. Academic Press, New York.
5. HAMMER, U.T. 1964. The succession of bloom - species of blue-green algae and some causal factors. *Verh. Internat. Verein. Limnol.* 15:829-836.
6. _____. 1969. Blue-green algal blooms in Saskatchewan lakes. *Verh. Internat. Verein. Limnol.* 17:116-125.
7. _____. 1995. Saline lake limnology - Saskatchewan style. *Blue Jay* 53:215-226.
8. HOLMS, R. 1996. Life Unlimited. *New Scientist* 149:26-29.
9. ODUM, P. 1971. Fundamentals of ecology. W.B. Saunders Co., New York.
10. RAJU, M.V.S. 1970. Red-tide in Wascana Lake. *Blue Jay* 28:50-53.
11. RAJU, M.V.S., D. YOUNG and J.E. HINES. 1971. A check-list of algae in Wascana Lake. *Blue Jay* 29:215-216.
12. RAJU, M.V.S., J.E. HINES and L.A. PENDLEBURY. Algal blooms. *Blue Jay* 30:56-61.
13. RAWSON, D.S. 1956. Algal indicators of trophic lake types. *Limnol. Oceanogr.* 1:18-25.
14. SCHOPF, J.W. 1970. Precambrian microorganisms and evolutionary events prior to the origin of vascular plants. *Biol. Rev.* 45:319-352.
15. SCHOFF, J.W. and M.R. WALTER. 1982. Origin and early evolution of Cyanobacteria: the geological evidence. Pp. 543-564. In N.G. Carr and B.A. Whitton (eds.). The Biology of Cyanobacteria. University of California, Berkeley.
16. STEWART, W.D.P. 1971. Physiological studies on nitrogen-fixing blue-green algae. *Plant and soil*, Special volume, pp. 371-391.
17. VALLENTYNE, J.R. 1974. The algal bowl - Lakes and man. Department of the Environment Fisheries and Marine Service, Ottawa, Canada.
18. VALLENTYNE, J.R. 1972. Freshwater supplies and pollution: effects of the demographic explosion on water and man. Pp. 181-211 In N. Pollunin (ed.). The environmental future. Macmillan, New York.

AMPHIBIANS AND REPTILES

CLUTCH SIZES IN MANITOBA COMMON SNAPPING TURTLES

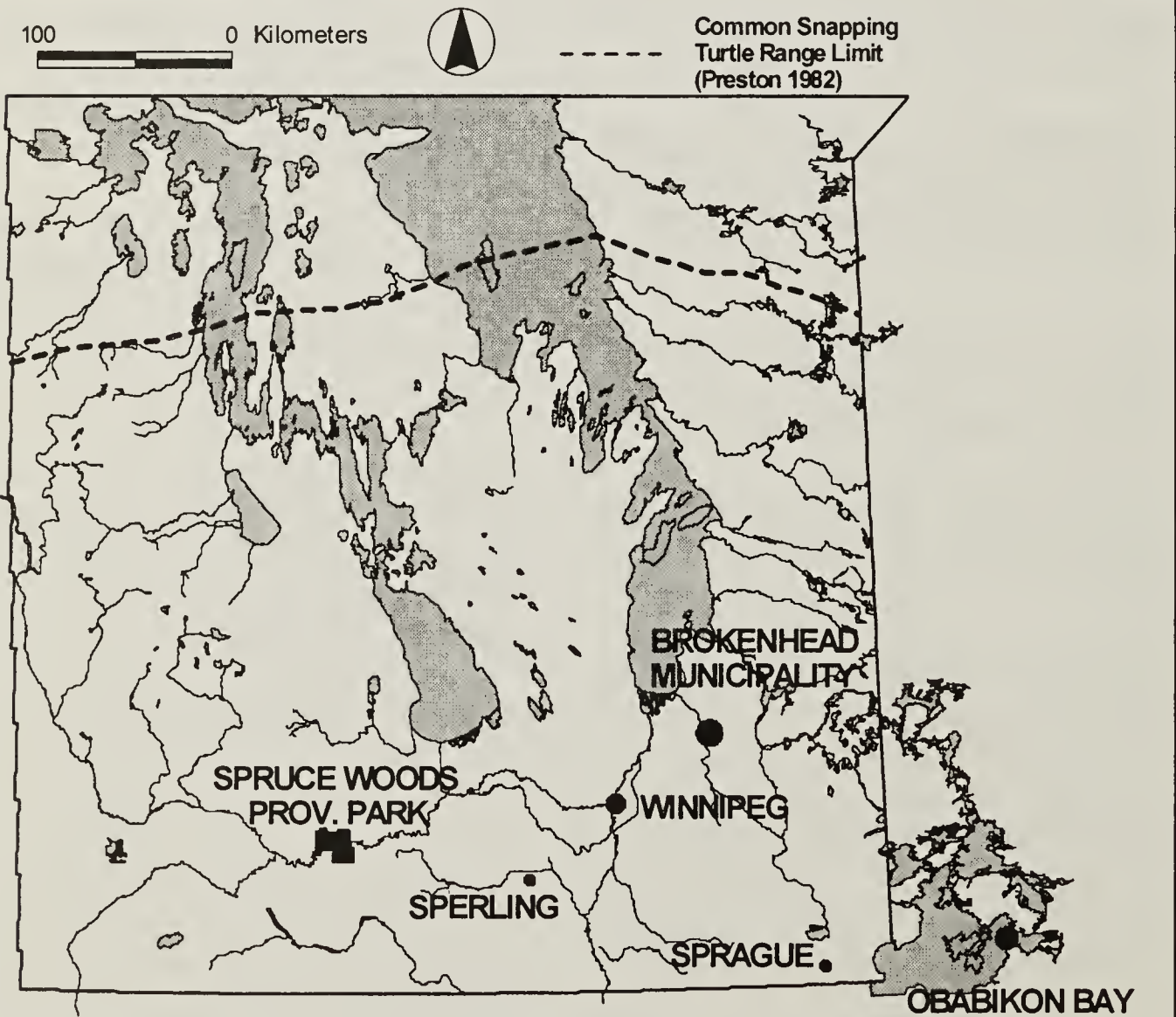
DEAN J. BEREZANSKI, Manitoba Natural Resources, Box 24, 200 Saulteaux Crescent, Winnipeg, MB R3J 3W3

Introduction

The Common Snapping Turtle (*Chelydra serpentina serpentina*) is one of two turtle species in Manitoba and ranges into the province as far as approximately 52°N Latitude (Figure 1). Seton described it as a “ferocious reptile

of great strength and insatiable appetite.”¹⁵ By weight, it is Canada's largest reptile: in Manitoba, one unsexed individual found near Sperling had a 533mm carapace length and weighed 18kg. Snapping Turtles live in permanent water bodies and feed on whatever they can find, such as carrion,

Figure 1 - Common Snapping Turtle range in Manitoba and nest locations from this article.



fish, birds, molluscs, and vegetation. They can be aggressively defensive when encountered out of water and their bites can inflict considerable damage.¹³ Studies suggest that maximum age may exceed 50 years.^{7,8}

The Common Snapping Turtle lays its eggs usually during June in sandy or gravelly soil near water.¹³ Although given as normally 20-40 eggs , a review of reported clutch sizes across North America gives a range from as few as six eggs in Florida to an unusual 109 eggs from Nebraska.^{13, 8} Clutch size for the species is positively related to female body size, altitude, and latitude, but no firm conclusion has been reached relating egg size to female size.^{8, 11} During incubation, temperature of the individual eggs at the critical time of sex determination determines sex of the hatchling.¹ Incubation for the species can take between 62 and 97 days.¹³

No studies have been done on the fecundity of this species in its Manitoba range. This article reviews reports on clutch sizes from Manitoba, including one from northwestern Ontario, and discusses these sizes relative to the species' life history here and throughout the rest of its North American range.

Methods

The author collected information on Common Snapping Turtle clutch sizes from personal observations, literature accounts, other individuals, actual counts, and in one case, photographic evidence (Table 1). All the data collected were from chance encounters of nesting turtles, including those from .⁹ In addition, his record from Obabikon Bay, Lake of the Woods in northwestern Ontario was included because the lake straddles the Ontario-Manitoba border.

Table 1 - Common Snapping Turtle clutch sizes in Manitoba and Region.

Clutch Size	Location and Approximate Coordinates	Date Observed	Comments	Reference
49	Obabikon Bay, Lake of the Woods, northwestern Ontario; 49° 14'N 94° 17'W	July 1944		Norris-Elye 1949
80	Assiniboine River at Riverbend Girls? School (now Balmoral Hall), Winnipeg; 49° 53'N 97° 09'W	June 17, 1946		Norris-Elye 1949
77	Sturgeon Creek at the Assiniboine River, Winnipeg; 49° 52'N 97° 16'W	June 20, 1948	26mm egg diameter	Norris-Elye 1949
70	Sprague River 49° 02'N 95° 38'W	June 18, 1982	2.6 km south of Sprague; carapace measured as 330mm (?13in?)	Preston (unpubl. data, Man. Museum Archives)
82	Kiche Manitou Lake (Pine Fort IV pathway), Spruce Woods Provincial Park (SWPP); 49° 39' N, 99° 15' W	June 15, 1989	Oxbow of Assiniboine River; see text	Author
59	Kiche Manitou Lake (Day Use Area, outhouse path), SWPP; 49° 39' N, 99° 15' W	June 22, 1989	Oxbow of Assiniboine River	Author
55	Kiche Manitou Lake (Playground sandbox), SWPP; 49° 39' N, 99° 15' W	June 29, 1989	Oxbow of Assiniboine River	Park staff
49	Drainage ditch, Brokenhead Municipality; 50° 14'N 96° 27'W	June 17, 1998	0.8km from Brokenhead River; see text	R. Shumila (pers. comm.)
56+ (est.)	Kiche Manitou Lake; SWPP; 49° 39' N, 99° 15' W	June 24, 1979	Oxbow of Assiniboine River; no. based on a photo of egg pile at time of relocation; see text	Preston 1982; Manitoba Parks Slide Show ?The Snapping Turtle?
50+ (est.)	Kiche Manitou Lake (Visitor Services Centre), SWPP; 49° 39' N, 99° 15' W	August 1987	Oxbow of Assiniboine River; clutch counted but no record kept	L.K. Leavesley (pers. comm.)

Two estimates are listed in Table 1 because counts of some form were made. These estimates were not included in any calculations. Preston (unpublished data, Man. Museum Archives) has records of clutch size estimates which were not included in this article because no actual counts were made.

Results

Common Snapping Turtle clutch sizes from Manitoba and northwestern Ontario are given in Table 1. The clutch size for observations where complete counts were made is 65.1 ± 13.8 eggs/clutch (mean \pm sd, n=8; range=49-82).

The turtle nests from Spruce Woods Provincial Park (SWPP), except the June 1979 nest, and from the Municipality of Brokenhead, were in locations where egg or potential hatchling survival was deemed hazardous because of human traffic. Eggs were excavated immediately and relocated away from these hazards.

The exact location of the June 1979 nest from SWPP was not known. The clutch was relocated to the trunk of an abandoned car, with subsequent hatching 97 days later of an unrecorded number.¹³ One hatchling from this clutch was albino (Figure 2), of which few have been recorded from Canada.¹⁴

The June 15, 1989 nest was found by the author the next day, destroyed by raccoons.

The nest in Brokenhead was relocated to a Winnipeg residence garden, with subsequent hatching of 38 eggs at 104 days. These 38 hatchlings were released into the Brokenhead River near the original nest site a few days later. The remaining eggs were then relocated into a terrarium in an apartment, with one egg hatching at 106 days and another at about 114 days. No more eggs had hatched at the time of writing this article (R. Shumila pers. comm.).

Hatching success was not followed up for the other clutches.



Figure 2 - Albino hatchling Common Snapping Turtle from Spruce Woods Provincial Park, 1979.
T. Ritzer.

Table 2 - Examples of Common Snapping Turtle clutch sizes

Mean \pm sd (or se; n)	Locale
65.1 \pm 13.8 (n=8)	Manitoba (this paper; includes one clutch from NW Ontario)
47.4 \pm 11.3 (n=26)	Valentine NWR, Nebraska (from raw data in Finkler 1998)
46.8 \pm 11.3 (n=77)	Crescent Lake NWR, Nebraska ¹⁰
41.5 \pm 12.86 (n=18)	Cootes Paradise, Lake Ontario, Ontario ³
37 \pm 11 (n=255)	New York state and Wisconsin ¹⁹
33.9 \pm 10.03 (\pm se; n=46)	Algonquin Park, Ontario ¹¹
33.0 \pm 8.39 (n=18)	Algonquin Park, Ontario ²
30.9 \pm 10.87 (n=16)	New York state ¹⁶
27.9 \pm 0.76 (\pm se; n=68)	Southeast Michigan ⁵
23.6 \pm 6.6 (\pm se, n=4)	North Carolina ⁶

Discussion

The mean clutch size for the Common Snapping Turtle in this article is larger than those reported from several other locations (Table 2).

Wildlife populations often exhibit different life strategies when at the extremes of a species' geographic range. Breeding female Common Snapping Turtles at our latitude would be expected to lay larger clutch sizes and have larger body sizes when compared to most U.S. populations. Using carapace length (CL) as an indicator of size, the largest average sizes of breeding females in North America are from populations in South Dakota (319mm) and Nebraska (325mm).⁸ The only Manitoba female measured was from 1982 and had a 330mm CL.¹³

Manitoba Snapping Turtles may also breed at later ages when body sizes are larger and, therefore, larger clutches can be laid. The average age at first nesting was estimated at 17-19 years in Algonquin Provincial Park, Ontario.⁷ In comparison, the youngest nesting

females in a Nebraska population were estimated at between 10-12 winters.⁸ The reason for a delay in egg-laying is thought to be that a larger body size improves survival in the harsher northern winter and increases fecundity.⁷

Clutch size may be related to habitat productivity. In a study of two Ontario Snapping Turtle populations, clutch size and clutch mass, when corrected for female body size, were significantly greater in the more productive habitat.³ The productivity of the various Manitoba habitats was not measured for comparison with other North American locations.

Snapping Turtle egg biology in Manitoba may differ in other aspects besides clutch size. While Western Painted Turtle eggs overwinter here, such a strategy may not be effective with Snapping Turtle eggs.¹³ Overwintering has been suggested in Manitoba, but its success was shown to be very low in Algonquin Park, Ontario (one successful clutch overwintering out of 129).^{13, 10}

Partly because of the species' life history traits, the Manitoba Conservation

Data Centre ranks the Common Snapping Turtle as "Uncommon" and indicates that it may be subject to large-scale disturbances.⁶ One such disturbance was reported in spring 1991 in Badger Creek, near Cartwright in southwestern Manitoba⁵ when over 40 Snapping and numerous Western Painted turtles were found dead or dying. Effluent was released into the creek earlier in the season from a hog farm waste lagoon upstream (C. Dixon, retired biologist, pers. comm.). In Algonquin Park, Ontario, the natural mortality of a Snapping Turtle population increased 20-fold over two years. Thought to be caused largely by otter predation, the estimated turtle population dropped by 65%. Subsequent studies on the potential long-term impacts from this sudden increase in natural mortality² emphasize the need for more research on the turtle's life history in Manitoba.

Acknowledgements

My thanks to: W. Preston and the Manitoba Museum for access to their records; Spruce Woods Provincial Park staff for information on nesting turtles; C. Scott, L.K. Leavesley, J. Duncan, and W. Koonz for reviews of earlier drafts; J. B. Iverson, W.G. Degenhardt, and M. Finkler for their help in locating references.

Literature Cited

1. BOBYN, M.L. AND R.J. BROOKS. 1994. Incubation conditions as potential factors limiting the northern distribution of snapping turtles, *Chelydra serpentina*. *Can. J. Zool.* 72:28-37.
2. BROOKS, R.J., G.P. BROWN., AND D.A. GALBRAITH. 1991. Effects of a sudden increase in natural mortality of adults on a population of the common snapping turtle (*Chelydra serpentina*). *Can. J. Zool.* 69:1314-1320.
3. BROWN, G.P. C.A. BISHOP, AND R.J. BROOKS. 1994. Growth rate, reproductive output, and temperature selection of snapping turtles in habitats of different productivities. *J. Herpetol.* 28(4):405-410.
4. CONGDON, J.D. AND J.W. GIBBONS. 1985. Egg components and reproductive characteristics of turtles: relationships to body size. *Herpetologica* 41:194-205.
5. DIXON, C. 1991. Wild things. *Boissevain Recorder*, May 29, 1991. Pg. 20.
6. DUNCAN, J. 1996. Conservation status ranks of the reptiles of Manitoba. Man. Conservation Data Centre MS Report 96-03, Winnipeg. 6pp.
7. GALBRAITH, D.A., R.J. BROOKS, AND M.E. OBBARD. 1989. The influence of growth rate on age and body size at maturity in female snapping turtles (*Chelydra serpentina*). *Copeia* 1984(4):896-904.
8. IVERSON J.B., H. HIGGINS, A. SIRULNIK, AND C. GRIFFITHS. 1997. Local and geographic variation in the reproductive biology of the snapping turtle (*Chelydra serpentina*). *Herpetologica* 53(1):96-117.
9. NORRIS-ELYE, L.T.S. 1949. The common snapping turtle (*Chelydra serpentina*) in Manitoba. *Can. Field-Nat.* 63:145-147.
10. OBBARD, M.E. AND R.J. BROOKS. 1981. Fate of overwintered clutches of the Common Snapping Turtle (*Chelydra serpentina*) in Algonquin Park, Ontario. *Can. Field-Nat.* 95:350-352.

11. PACKARD, G. C., M.J. PACKARD and K. Miller. 1990. *Chelydra serpentina* (Common Snapping Turtle). Fecundity, Herpet. Rev.21:92

12. PETOKAS, P.J. AND M.M. ALEXANDER. 1980. The nesting of *Chelydra serpentina* in northern New York. *J. Herpetol.* 14:239-244.

13. PRESTON, W.B. 1982. The amphibians and reptiles of Manitoba. Man. Museum of Man and Nature, Winnipeg. 128 pp.

14. SAUMURE, R.A. AND D. RODRIGUE. 1998. An albino snapping turtle, *Chelydra serpentina*, from Quebec. *Can. Field-Nat.* 112:344.

15. SETON, E.T. 1918. A list of the turtles, snakes, and batrachians of Manitoba. *Ottawa Field-Nat.* 32:79-83.



**Adult female Common Snapping Turtle, Spruce Woods Provincial Park
June 15, 1989**

D.J. Berezanski

NOTES AND LETTERS

VARIED THRUSH AT WALDHEIM

BARB EPP, Box 164, Waldheim, SK S0K 4R0

Around the 1st of December 1998 a Varied Thrush showed up on Vicki Gossen's yard in Waldheim SK. (60km N of Saskatoon). At first it was skittish and would fly away with any movement in the house, cars driving by etc. After getting used to it's new surroundings it is easily observed hanging out with sparrows and eating black oil sunflower seeds on the ground. When the temperature dropped to -30 Vicki decided to try to up the Varied Thrush's calorie intake. She put a fruit and nut

suet cake on the ground and the bird pecks at it readily. It is not clear if it is eating the fruit, nuts or suet.

When the Hairy Woodpecker decides to eat from the suet cake on the ground instead of his own hanging from the tree, the thrush dive-bombs him and scares him off. After eating its fill the Thrush suns itself on the ground against the tree out of the wind or in the tree's branches. It was not seen again after 3 Jan 1999.



Varied Thrush

Barb Epp

THE REGAL FRITILLARY IN SASKATCHEWAN

RON HOOPER, Box 757, Fort Qu'Appelle, SK S0G 1S0

On 26 July 1998 Ross Layberry (one of the authors of "Butterflies of Canada" - see page 63) was collecting butterflies in the area of Big Muddy Lake, SK. He saw a large butterfly heading northward over an alkali flat. It was flying, with the aid of a tail wind, about the height of a person. After a chase of several hundred metres he managed to catch it. It was a worn specimen of the Regal Fritillary (*Speyeria idalia*) and a first record for Saskatchewan. It had previously been taken north to southern Manitoba and eastern Montana.

This beautiful butterfly is the largest of our fritillaries, with a wingspan from

6.6 to 9.2 cm. It looks like a typical fritillary on the upperside of the forewings with black markings on an orange background. The hindwings are unique, however, being black with two rows of pale spots. On the underside, the hind wing spots are well silvered and surrounded by dark brown.

The food plants of the Regal Fritillary are violets. Fresh specimens collected in southern Manitoba one summer suggested a temporary colony might have been established. Most western Canadian specimens are evidently strays.



Regal Fritillary - Kansas Specimen

Keith Roney

SIGHTING OF A BAND-TAILED PIGEON AT MEDICINE HAT

SIG JORDHEIM, Kyle, SK

On May 8, 1998 I took my wife Ruby to Medicine Hat. Sunday was Mothers Day, and our son Cameron, who lives in Medicine Hat, wished to give her a present of her own choosing.

Cameron has a house there that overlooks the South Saskatchewan River. Saturday morning, we were sitting on the balcony enjoying the view, when I noted a medium size bird fly over the house and land on a treetop a block away. The bird, after a short look around began eating, presumably the cottonwood seed heads.

This bird was very pigeon-like in flight and shape, but was doing something unusual for a Rock Dove. I had seen a Band-tailed Pigeon on my farm near Kyle, Saskatchewan for three days in

1988. I wondered if this bird was the same species. Through binoculars, I noted the yellow bill and the white ring on the neck, but as it was facing us it was not possible to see the band on the tail. We notified the Interpretation Centre at Police Point and found that the Band-tailed Pigeon was not on the bird list for Medicine Hat and had not been identified there.

The bird stayed in the same tree all day, Saturday, spending much time resting, was gone for a brief period Sunday morning but soon returned to that particular tree. I phoned Jo Anne Reynolds, Treasurer and Co-Editor of the Grasslands Naturalists. I understand that she was able to see the bird, later that day, after we had left for Saskatchewan.



Our task in North America is more demanding than in England, where fewer than 70 species of butterflies occur; much less so than in Costa Rica, where some 2,000 species fly.

We have something under 700 species, about the same number as North American birds.

OUT AND ABOUT - FIFTY YEARS OF WILDLIFE WATCHING.

DOUG GILROY, 1998, Fifth House Ltd., Calgary, AB. 150pp. Soft Cover \$18.95.

Doug Gilroy lives in the resort town of Regina Beach, along the shoreline of Last Mountain Lake, Saskatchewan. Now 82, he began writing about the outdoors as a young man. His column "Prairie Wildlife" appeared for the first time in 1954 in *The Western Producer*, published in Saskatoon by Western Producer Publications, a division of the Saskatchewan Wheat Pool. Gilroy has had four books published by Western Producer Prairie Books; the first book appeared in 1967. He also has had articles published in *Blue Jay*, and has been invited locally to present numerous slide-illustrated lectures about wildlife.

Out and About is a collection of 55 short stories previously published in *The Western Producer*. As would be expected, the articles are each about two pages of single-spaced text. Each article is headlined with a pencil sketch by Gilroy of a family of ducks resting on a marsh. The drawing is very attractive, delicate and serene. A small colour photograph from Gilroy's personal collection also accompanies each article. The subtext for each photograph identifies the subject, and provides a few words of interpretation. The book publisher has done a terrific job of reproducing the photographs, which add colour and interest throughout.

Out and About begins with "Welcome to the Wild", his first article on prairie wildlife for *The Western Producer*, published 7 January 1954. The article provides an overview of various wildlife

that live near his farm, and this sets the stage for subsequent articles that provide more information about the plants and animals in his local area. Unfortunately, there is no particular arrangement for the sequence of articles. The book is a veritable potpourri of observations and stories collected from readers of his "Prairie Wildlife" column. *Out and About* stretches from a short discussion of sow thistle and how plants have evolved different mechanisms for seed dispersal, to such topics as rescuing a great horned owl from a grain dryer. Each article begins with a different topic, and then within any given article Gilroy often digresses in the next paragraph to other topics or observations. This tendency to change subject material among paragraphs creates confusion and is quite unsatisfying. As I read this book, I kept asking myself: "what happened to the original idea at the top of the article?" In any case, the articles are interesting and entertaining, and they add to the collective experience of many of us who were born and raised on the Canadian prairies and who subsequently developed an interest in natural history.

An important deficiency in *Out and About* is the absence of Latin. Latin is needed to identify the species of Gilroy's countryside. Use of vernacular may be adequate for a local prairie audience, however, local names may be confusing to a wider readership. For example, Gilroy refers to "purple or ball cactus" and "golden peas." I am guessing, but I

think he means the pincushion cactus, *Mamillaria vivipara*, and my guess is that golden peas he is referring to are golden-bean, *Thermopsis rhombifolia*. I am totally lost to identify the butterflies "that come to call." A retrofit of scientific names by an editor would have increased the overall value of his book. Another short-coming of the book is the absence of references to little known and historical facts that Gilroy sprinkles throughout his book. Documentation of the various facts would greatly increase the value of his book, and make it more interesting and challenging. And, I would have preferred if Gilroy had included the original dates for each article. Without a date on each article, Gilroy's observations of nature's fluctuations of abundance and scarcity have no lasting meaning. For example, while Gilroy records the spring migration of Black-bellied plovers in southern Saskatchewan, he does not provide the date of this observation.

Gilroy notes that white-tailed deer and the mule deer lived on his farm, but he mentions nothing of their different ecology, or how they may have inter-mixed. He mentions that his

favourite wildlife on the farm is the western chipmunk, but does not explain why this is his "favourite." Gilroy notes that Franklin's ground squirrel were common on his farm, and he explains that on wetland habitats of the countryside, waterfowl use ponds maintained by beaver "that moved in." He mentions there are some 70 species of bird life nesting on this piece of land, but reserves specific mention for subsequent articles. In most of his writing, he portrays an anthropomorphic view of the natural world, conveyed with such sentiments as the early spring robins providing a "song to welcome a brand new day." But overall, it is light and enjoyable reading, and accomplishes what I imagine Gilroy probably intended with his newspaper column - to raise awareness and empathy for wildlife and the natural world.

I can recommend Doug Gilroy's book "Out and About" as a primer for young readers who may be developing an interest in natural history.

Reviewed by *Garry E. Hornbeck* , 312 Cedarille Crescent, SW, Calgary, AB T2W 2H7.



Of 77 Common Loons found dead in New England, more than half had died from lead poisoning, and half of these had eaten lead fishing sinkers.

Lead sinkers are banned in Great Britain and the Environmental Protection agency is investigating whether they should be banned in the United States.

A FIELD GUIDE TO EASTERN BUTTERFLIES

PAUL A. OPLER and VICHAI MALIKUL. 1998. Houghton Mifflin, Boston. 485 pp. \$29, soft cover. 113x184 mm. Peterson Field Guide Series. ISBN 0-395-90453-6

This is a pretty book. Except for two copyright dates, nothing is said about its being a revision of the 1992 version, presumably because changes largely involve the format. They start with the cover (the signature colours of part of the Peterson series are now brown and yellow instead of blue and white), followed by a more attractive layout, a new organization and 90 more numbered pages "glossy", rather than flat.

It does not appear that the text for species has been changed but the information is in one good-looking paragraph instead of 4 or 5 and the type is a little smaller, saving a few lines per species. Many of the English names have been changed to conform with the North American Butterfly Association's 1995 list.² Two recent titles have been added to the references, the list of butterfly houses has gone from four to eight (including the Metro Toronto Zoo), the number of butterfly organizations has been increased by two and several of the contacts for others have been updated.

In 1992, the plates divided the text in two. The new version has the plates in front. Plates 1-4 - from plants to pupae - and the 35 plates (14 - 48 in the original) of butterflies are still the same. However, the paintings are now sharper and brighter and, although the scales are the same, e.g., full size to half-size, the images are larger by about 10%.

While the colour is good in most cases, a major criticism is the emphasis

on yellow. This makes the ground colour of commas too bright. Uhler's Arctic is shown as yellow, rather than light brown. It may also account for some of the dark browns being lighter than natural, e.g., Northern Cloudywing.

Plate 9 has more than its share of errors. The first of four Orange Sulphur images is the (unlabelled) spring form; the other three labelled "Spring form" are actually the summer form. The Pink-edged Sulphur label should be centered under the first three images, instead of the first two. However, the names for Palaeno and Pelidne sulphurs have been reversed, correcting an earlier error.

Former plates 5 to 13 (photos of 68 species in natural habitats) have been replaced by 101 individual photos fitted into the species accounts. However, the organization would have been more user friendly if the publisher had not felt the need to slavishly follow the formula of photo-at-top and/or photo-at-bottom of a page. Some are within the illustrated species' text or immediately before or after. However, the majority are within other species' treatments either on the same page, a facing page or the next page over. The Hobomok Skipper photo is two pages from the species' account.

Perhaps the most attractive change is coloured maps - red for areas of residence, blue for regular migration areas and yellow (a poor choice) for stragglers. The maps do not appear to have been changed and, as in the

original, any map that includes the Arctic islands does not show province and state boundaries!

How to account for 90 more pages when dealing with the same number of species-- 524 -- and while saving space as noted above? Largely because the 39 plates and their facing legends now have page numbers, resulting in 78 "extra" pages. The remainder is because each of the 101 species photos, with several lines of text, occupies a third of a page.

The guide does not recognize recent research that changes the status of some species, e.g., splitting Common Branded Skipper into Common Branded and Plains, and the combining of *Titania* and Arctic fritillaries into Arctic.

This volume illustrates about 97% of Manitoba's butterflies, 85% of Saskatchewan's and 70% of Alberta's. However, for 100% coverage, better

identification aids and flight periods, more accurate and easily interpreted ranges (as well as additional information), the *Butterflies of Canada* is much better for the Prairies, even though its large format is a pain in the neck.¹ (A more detailed review of the 1992 Peterson appeared in the September 1994 *Blue Jay*. Vol. 52, No. 3).

1.LAYBERRY, ROSS, PETER HALL and DON LAFONTAINE. 1998. *The butterflies of Canada*. University of Toronto Press, Toronto. 280 pages + 32 plates. 223 x 280 mm. \$29.95, soft cover, ISBN 0-8020-7881-8.

2.NORTH AMERICAN BUTTERFLY ASSOCIATION. 1995. *Checklist & English names of North American butterflies*. North American Butterfly Association, 4 Delaware Road, Morristown, NJ 07960. 43 pages. \$7 US (includes shipping).

Reviewed by *Bernie Gollop*, 2202 York Ave., Saskatoon, SK S7J 1J1



The greatest butterfly spectacles on earth, the winter aggregations of migratory Monarchs, stand in jeopardy from coastal development in California and logging in Mexico.

For butterflies that overwinter as adults, you may wish to try placing hibernation cells about. These could be coffee cans in the crook of a tree, half full of dry leaves and bark; empty birdhouses; or anything that successfully mimics a hollow tree with an inviting orifice and protective thermal insulation.

THE BUTTERFLIES OF CANADA

ROSS LAYBERRY, PETER HALL and DON LAFONTAINE. 1998. University of Toronto Press, Toronto. 280 pages + 32 plates. 225 x 280 mm. \$29.95, soft cover, ISBN 0-8020-7881-8.

This is a pretty, excellent book. It discusses, illustrates and maps every species in the Prairie Provinces (as well as those other parts of Canada -- 293 butterflies in total). The text for each occupies from half to a full page under the headings of Diagnosis, Subspecies, Range, Similar Species, Early Stages, Abundance, Flight Season, Habits and Remarks. What else is there?

Introductory and concluding sections treat the history of butterfly study in Canada, geography and changing distributions, migrants, observing, photography, gardening, conservation, taxonomy and life history. They also include a national checklist, collecting guidelines, glossary, bibliography and index to caterpillar food plants. Based on recent research, the English names are updated from the North American Butterfly Association's 1995 list.¹

One learns, for instance, that a sulphur, discovered in 1916 on a hill near Bernard Harbour on the Arctic coast was not seen again during many Arctic expeditions until 1988, when two scientists, studying the original explorer's diaries, located that hill and found a thriving colony still there - the only known site for Johansen's Sulphur. And that 33 species migrate to Canada either regularly, sometimes becoming common, or occasionally, as strays.

Colour photographs make up 20 plates of museum specimens, 2 of immature stages in the wild, and 10 devoted to different habitats. Identification plates show from 7 to 33 species - life size. Male and female,

upper and lower wing surfaces, when needed for identification, are presented in excellent colour. The legends are on facing pages with the images numbered. In Plate 2, the name "Colorado Skipper" is used instead of Western Branded Skipper, as in the text.

Each habitat plate illustrates eight typical butterflies in natural settings and two landscapes - a neat addition. However, there is no reference in the text to these plates, leaving readers to draw their own conclusions about them. The habitats vary from life zones, e.g., Boreal Forest, to Roadsides and Fields. Polixenes Arctic and Arctic Blue are each shown in two habitats - as different subspecies. One wonders about using Indra Swallowtail as typical of a habitat in which it occurs at only one mountain pass in Canada.

The maps are a particularly valuable contribution. They are based on 90,000 records in the Canadian National Insect Collection - 3,885 for Saskatchewan, including those from the Royal Saskatchewan Museum. Each record is a dot. Map scales vary with the distribution of species - from country-wide to regional.

What is the most widespread butterfly in Canada? Because there are no regional checklists, one is forced to study 293 maps to find that some 16 species occur in all provinces and territories. The most widespread? Probably a toss-up among Spring Azure, Silvery Blue, Mourning Cloak and Red-spotted Purple (including its subspecies, the White Admiral). The

most widespread north of 60° is Freija Fritillary.

Major errors for Saskatchewan are: the inclusion of Lorquin's Admiral (a discredited hypothetical); the omission of Western Tiger Swallowtail (Cypress Hills) and Indian Skipper (Somme) -- the latter discovered in the museum collection after the book had gone to press. At least four of the Summer Azure records south of Wildcat Hills and Candle Lake are actually late Spring Azures. For Rocky Mountain Parnassian and Juniper Hairstreak, the two dots close together should be only one - single provincial records. For the West Coast Lady, Indian Head is correct, Regina should be deleted and Cypress Hills added. Still to be inserted is the 26 July 1998 discovery by Ross Layberry of a new species for the province - a very ragged Regal Fritillary near Big Muddy - bringing the province's total to 157.

No publication will ever satisfy all the critics. My belligerent beef is that butterfly names and sexes are not printed by each image, as has been done for decades in all the Peterson field guides.

Then there is size - a considerable problem for those of us used to carrying small-format field guides for the last hundred years. To be readily available in the field, this one requires either a super-sized pocket, a backpack or (heaven forbid!) a colour-photocopy reduction of at least the plates to fit into a pocket-sized loose-leaf.

University of Toronto Press committed a major faux pas in producing the soft cover with a glued binding. As those who use the book a lot soon find out, the plates start shedding in a month or two. UTP has told me that anyone who bought this version can return it to their local dealer for a coil-bound replacement.

If you have only one butterfly book, this should be it.

1. North American Butterfly Association. 1995. Checklist & English names of North American butterflies. North American Butterfly Association, 4 Delaware Road, Morristown, NJ 07960.

Reviewed by *Bernie Gollop*, 2202 York Ave., Saskatoon, SK S7J 1J1



For butterflies that overwinter as adults, you may wish to try placing hibernation cells about. These could be coffee cans in the crook of a tree, half full of dry leaves and bark; empty birdhouses; or anything that successfully mimics a hollow tree with an inviting orifice and protective thermal insulation.

MEMBERSHIP APPLICATION FORM

☐ Renewal

Address

Phone Fax E-Mail

☐ Gift Membership:

Address

Phone Fax E-Mail

Five Year

☐ \$95

☐ \$115

☐ \$75☐ \$115☐ \$600

☐ Grasslands Trust Fund \$ _____

winning nature magazine *Nature Canada* and the conservation newsletter *Nature Alert*.

☐ Send information on CNF

TOTAL \$ _____

Cardholder's Name: _____

Expiry date __/__/__ Signature _____

Regina, Saskatchewan S4P 2L7

to renew by Visa or Mastercard

THIS ORGANIZATION RECEIVES FUNDING FROM:



NATURE SASKATCHEWAN



206-1860 Lorne Street, REGINA, SASKATCHEWAN S4P 2L7
PHONE: (306) 780-9273 – in Regina
1-800-667-HOOT (4668) – elsewhere in Saskatchewan
FAX: (306) 780-9263
E-mail: nature.sask@unibase.com
Web: www.unibase.com/~naturesk

BOARD OF DIRECTORS

Honourary President.....Mary Gilliland 902 University Dr, Saskatoon, SK S7N 0K1

OFFICERS

Past President Kathleen Donauer 11 Mowat Place, Regina, SK S4R 3W3
President..... Diana Bizecki Robson 811 Ave. E N, Saskatoon, SK S7L 1S7
1st Vice-President William Sarjeant 674 University Dr, Saskatoon, SK S7N 0J2
2nd Vice-President position vacant
Secretary Leona Pollock Box 255, Preeceville, SK S0A 3B0
Treasurer Dale Hjertaas 15 Olson Place, Regina, SK S4S 2V6
Administration Director ... Ruby LaFayette Box 1405, Rosetown, SK S0L 2V0
Conservation Director Garth Nelson 529 Dalhousie Cr., Saskatoon, SK S7H 3S5
Education Director Greg Fenty..... 2327 Landsdowne Ave, Saskatoon, SK S7J 1G8
Member Services Dir. Carla Palaschuk Box 15, Wishart, SK S0A 4R0
Research Director Ann Gerry 30 Scott Street, Regina, SK S4S 4A2
Member at Large Phyllis Bordass Box 313, Fort Qu'Appelle, SK S0G 1S0
Member at Large Lucille Bradatsch 10-303 Saguenay Dr, Saskatoon, SK S7K 5R2
Member at Large Attila Chanady 42 Proctor Place, Regina, SK S4S 4G1
Member at Large Wayne Pepper 50 Sommerfeld Dr, Regina, SK S4V 0C7
Member at Large Geoff Rushowick 45 Darlington St. E, Yorkton S3N 0C3

STAFF

Administration Coordinator Sheila Fahlman
Program Coordinator Margaret Skeel

LOCAL SOCIETY PRESIDENTS

Fort Qu'Appelle Natural History Society

Ron Hooper Box 757, Fort Qu'Appelle, SK S0G 1S0

Indian Head Natural History Society

David Gehl Box 1177, Indian Head, SK S0G 2K0

Kelsey Ecological Society

David Weiman Box 1000, Preeceville, SK S0A 3B0

Luseland and Districts Millennium Prairie Project

Joan Onerheim-Fetterly Box 2, Luseland, SK S0L 2A0

Melfort Natural History Society

Kate Johnson Box 1237, Melfort, SK S0E 1A0

Nature Moose Jaw

Barrie Dowse Box 2042, Moose Jaw, SK S6H 7T2

Nature Prince Albert

Carman Dodge Box 285, Prince Albert, SK S6V 5R5

Regina Natural History Society

Wayne Pepper 50 Sommerfield Drive, Regina, SK S4V 0C7

Saskatoon Nature Society Inc.

Greg Fenty 2327 Landsdowne Avenue, Saskatoon, SK S7J 1G8

Southwest Naturalists

Irene Stinson 449 - 2nd Avenue S.E., Swift Current, SK S9H 3J7

Weyburn Natural Society Inc.

Greg Bobbitt 1501 1st Avenue, N.W., Weyburn, SK S4H 3E3

Yorkton Natural History Society

Mark Kornder Box 1359, Yorkton, SK S3N 3G2

* 1



Publication Sales Agreement No. 0431095.

Postage paid at Regina.

Please return unclaimed copies.

Return postage guaranteed.

206-1860 Lorne Street,
Regina, Saskatchewan

University of Alberta Library 31/
Bibliographic Services - Serials
5th Floor Cameron
Edmonton AB T6G 2J8

